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A. Gallatin's

REPORT

OF THE

SECRETARY OF THE TREASURY,

ON THE SUBJECT OF

PUBLIC ROADS AND CANALS;

MADE

IN PURSUANCE OF A RESOLUTION OF SENATE,

OF MARCH 2, 1807.

APRIL 12, 1808.

PRINTED BY ORDER OF THE SENATE..

WASHINGTON:

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1808.

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IN SENATE
OF
THE UNITED STATES.

APRIL 12th, 1808.

MR. ADAMS, from the committee appointed on the subject of public roads and canals, reported, that 1200 copies of the following papers, be printed for the use of the Senate :

Resolution of Senate, of 2d March, 1807,

A letter from the secretary of the treasury;

Report of same;

Circular queries of the same;

Mr. Latrobe's communication marked E; and

Mr. Fulton's letter marked F.

IN SENATE OF THE UNITED STATES.

March 2, 1807.

Resolved, That the secretary of the treasury be directed to prepare and report to the Senate, at their next session, a plan for the application of such means as are within the power of Congress, to the purposes of opening roads, and making canals; together with a statement of the undertakings, of that nature, which as objects of public improvement, may require and deserve the aid of government; and also a statement of works of the nature mentioned, which have been commenced, the progress which has been made in them, and the means and prospect of their being completed; and such information as, in the opinion of the secretary, shall be material, in relation to the objects of this resolution.

Attest,

SAMUEL A. OTIS, *Secretary.*

TREASURY DEPARTMENT,

April 4th, 1808.

SIR,

I HAVE the honor to transmit a report respecting roads and canals; prepared in obedience to the resolution of the Senate, of the 2d of March, 1807. It has been unavoidably delayed much later than was desirable, or had been expected. Although early steps had been taken for obtaining the necessary information, the most important documents were not received till long after the commencement of this session, some indeed, within the last ten days. To analyze the whole, to select, arrange and condense the most interesting facts, was also a work of some labor. Time has not permitted to present the report in a more satisfactory form: but the mass of facts, which has been collected, will, it is hoped, be of some public utility.

I have the honor to be,

With great respect,

Sir,

Your most obedient servant,

ALBERT GALLATIN.

The Hon. GEORGE CLINTON,

President of the Senate.

REPORT.

The Secretary of the Treasury, in obedience to the resolution of the Senate of the 2d March, 1807, respectfully submits the following report on roads and canals.

THE general utility of artificial roads and canals, is at this time so universally admitted, as hardly to require any additional proofs. It is sufficiently evident that, whenever the annual expense of transportation on a certain route in its natural state, exceeds the interest on the capital employed in improving the communication, and the annual expense of transportation (exclusively of the tolls,) by the improved route; the difference is an annual additional income to the nation. Nor does in that case the general result vary, although the tolls may not have been fixed at a rate sufficient to pay to the undertakers the interest on the capital laid out. They indeed, when that happens, lose; but the community is nevertheless benefited by the undertaking. The general gain is not confined to the difference between the expenses of the transportation of those articles which had been formerly conveyed by that route, but many which were brought to market by other channels, will then find a new and more advantageous direction; and those which on account of their distance or weight could not be transported in any manner whatever, will acquire a value, and become a clear addition to the national wealth. Those and many other advantages have become so obvious, that in countries possessed of a large capital, where pro-

perty is sufficiently secure to induce individuals to lay out that capital on permanent undertakings, and where a compact population creates an extensive commercial intercourse, within short distances, those improvements may often, in ordinary cases, be left to individual exertion, without any direct aid from government.

There are however some circumstances, which, whilst they render the facility of communications throughout the United States an object of primary importance, naturally check the application of private capital and enterprize, to improvements on a large scale.

The price of labor is not considered as a formidable obstacle, because whatever it may be, it equally affects the expense of transportation, which is saved by the improvement, and that of effecting the improvement itself. The want of practical knowledge is no longer felt : and the occasional influence of mistaken local interests, in sometimes thwarting or giving an improper direction to public improvements, arises from the nature of man, and is common to all countries. The great demand for capital in the United States, and the extent of territory compared with the population, are, it is believed, the true causes which prevent new undertakings, and render those already accomplished, less profitable than had been expected.

1. Notwithstanding the great increase of capital during the last fifteen years, the objects for which it is required continue to be more numerous, and its application is generally more profitable than in Europe. A small portion therefore is applied to objects which offer only the prospect of remote and moderate profit. And it also happens that a less sum being subscribed at first, than is actually requisite for completing the work, this proceeds slowly ; the capital applied remains unproductive for a much longer time than was necessary, and the interest

accruing during that period, becomes in fact an injurious addition to the real expense of the undertaking.

2. The present population of the United States, compared with the extent of territory over which it is spread, does not, except in the vicinity of the sea-ports, admit that extensive commercial intercourse within short distances, which, in England and some other countries, forms the principal support of artificial roads and canals. With a few exceptions, canals particularly, cannot in America be undertaken with a view solely to the intercourse between the two extremes of, and along the intermediate ground which they occupy. It is necessary, in order to be productive, that the canal should open a communication with a natural extensive navigation which will flow through that new channel. It follows that whenever that navigation requires to be improved, or when it might at some distance be connected by another canal to another navigation, the first canal will remain comparatively unproductive, until the other improvements are effected, until the other canal is also completed. Thus the intended canal between the Chesapeake and Delaware, will be deprived of the additional benefit arising from the intercourse between New York and the Chesapeake, until an inland navigation, shall have been opened between the Delaware and New York. Thus the expensive canals completed around the falls of Potomac, will become more and more productive in proportion to the improvement, first of the navigation of the upper branches of the river, and then of its communication with the western waters. Some works already executed are unprofitable, many more remain unattempted, because their ultimate productiveness depends on other improvements, too extensive or too distant to be embraced by the same individuals.

The general government can alone remove these obstacles.

With resources amply sufficient for the completion of every practicable improvement, it will always supply the capital wanted for any work which it may undertake, as fast as the work itself can progress, avoiding thereby the ruinous loss of interest on a dormant capital, and reducing the real expense to its lowest rate.

With these resources, and embracing the whole union, it will complete on any given line all the improvements, however distant, which may be necessary to render the whole productive, and eminently beneficial.

The early and efficient aid of the *federal* government is recommended by still more important considerations. The inconveniencies, complaints, and perhaps dangers, which may result from a vast extent of territory, can no otherwise be radically removed, or prevented, than by opening speedy and easy communications through all its parts. Good roads and canals, will shorten distances, facilitate commercial and personal intercourse, and unite by a still more intimate community of interests, the most remote quarters of the United States. No other single operation, within the power of government, can more effectually tend to strengthen and perpetuate that union, which secures external independence, domestic peace, and internal liberty.

With that view of the subject, the facts respecting canals, which have been collected in pursuance of the resolution of the Senate, have been arranged under the following heads:—

1. Great canals, from north to south, along the Atlantic sea coast.
2. Communications between the Atlantic and western waters.
3. Communications between the Atlantic waters, and those of the great lakes, and river St. Lawrence.
4. Interior canals.

GREAT CANALS, ALONG THE ATLANTIC SEA COAST.

THE map of the United States will shew that they possess a tide-water inland navigation, secure from storms and enemies, and which, from Massachusetts to the southern extremity of Georgia, is principally, if not solely, interrupted by four necks of land.—These are the isthmus of Barnstable; that part of New Jersey, which extends from the Rariton to the Delaware; the peninsula between the Delaware and the Chesapeake; and that low and marshy tract which divides the Chesapeake from Albemarle sound. It is ascertained that a navigation for sea vessels, drawing eight feet of water, may be effected across the three last; and a canal is also believed to be practicable; not perhaps across the isthmus of Barnstable, but from the harbor of Boston to that of Rhode Island. The Massachusetts canal would be about 26, the New Jersey about 28, and each of the two southern about 22 miles in length, making altogether less than one hundred miles.

Should this great work, the expense of which, as will hereafter be shewn, is estimated at about three millions of dollars, be accomplished, a sea vessel entering the first canal in the harbor of Boston, would through the bay of Rhode Island, Long Island sound, and the harbor of New York, reach Brunswick on the Rariton; thence pass through the second canal to Trenton on the Delaware, down that river to Christiana, or New Castle, and through the third canal to Elk river, and the Chesapeake; whence sailing down that bay, and up Elizabeth river, it would, through the fourth canal, enter the Albemarle sound, and by Pamptico, Core and Bogue sounds, reach Beaufort and Swansborough, in North Carolina. From the last mentioned place, the inland navigation, through Stumpy and Toomer's sounds, is continued with a diminished draft of water, and by cutting

two low and narrow necks, not exceeding three miles together, to Cape Fear river; and thence, by an open but short and direct run along the coast, is reached that chain of islands between which and the main, the inland navigation is continued to St. Mary's, along the coast of South Carolina, and Georgia. It is unnecessary to add any comments on the utility of the work, in peace or war, for the transportation of merchandize, or the conveyance of persons.

The several papers under the letter (A.) herewith transmitted, contain the information which has been received on those several intended communications. The substance will now be stated.

I. MASSACHUSETTS CANAL.

1. SANDWICH isthmus, between Barnstable bay on the north, and Buzzard's bay on the south, had first attracted the public attention. Surveys and levels were taken, for the purpose of ascertaining the practicability of opening a cross cut, to be supplied by the sea itself, from the mouth of Back river, in Buzzard's bay, to the mouth of Scusset river, in Barnstable bay.

The distance was found to exceed 7 miles; the elevation of the highest intermediate ground is forty feet above low water mark in Barnstable bay; the depth of water at the mouth of Back river, does not at low water, exceed 7 feet and a half; and the channel to that spot through Buzzard bay, is obstructed by shoals. The tide which rises but three feet and a half in that bay, rises three hours and a half later, and more than eighteen feet in that of Barnstable. The shore on which that formidable tide would operate, is an open beach, without any harbor or shelter whatever. Independent of other obstacles, it was apprehended that the same natural causes, which had formed the isthmus, might fill the canal, or make a bar at its entrance; and the project seems to have been abandoned.

2. The ground was also examined between Barn-

stable harbor on the north, and Hyannus harbor on the south, at some distance east of Sandwich. The breadth of the peninsula does not exceed here four miles and a half, and there would be an harbor at each end of the canal. The same difference exists in the tides which rise 4 feet in Hyannus, and 16 feet in Barnstable harbor. The entrance of this is obstructed by shoals; but the great obstacle to a cross cut, is the elevation of the intermediate ground, estimated at 80 feet above tide water. Navigable ponds, on that high ground might perhaps form part of a lock canal, and supply the remainder with water. But a canal frozen in winter, would not have effected the great object in view, which was to enable vessels from sea, to proceed in winter from Martha's Vineyard, to Boston, witho t sailing around Cape Cod. Although the difficulty of the navigation from Boston to Barnstable, diminishes the utility of this communication, as one of the great links in this line of inland navigation, it may be resorted to, should that which will be next mentioned, prove impracticable for sea vessels.

3. The attention of the legislature of Massachusetts, under whose authority the grounds at Sandwich and Barnstable, had been examined, has lately been turned to a direct communication between Weymouth landing, within the harbor of Boston, and Taunton river, which empties into the bay of Rhode Island. A favorable report has been made, during the last session, of which a copy has lately been obtained. The distance from tide water to tide water, is 26 miles by one route, and 23 1-4 miles by another. The highest intermediate ground, is 133 feet above tide water, but may be reduced ten feet, by digging to that depth, the length of a mile. Two ponds known by the names of Weymouth and Cranberry, the largest and least elevated of which covers five hundred acres, and is 14 feet higher than the summit of the proposed canal, will supply the upper locks with water by feeders, four miles long. Whether the quantity of water contained in those

ponds, and estimated equal to a daily supply of 450,000 cubic feet, will be sufficient for a sloop navigation ; and whether any other ponds or streams may be brought in aid, does not seem to be fully ascertained. After descending twenty feet towards Weymouth, and seventy towards Taunton, an ample supply for the lower locks, will be derived from other large ponds, the principal of which are known by the names of Braintree and Nippinitic.

The expense may, on a supposition that the route is partly through a rocky soil, be estimated as follows :

Digging 26 miles, at \$ 30,000 a mile,	\$ 780,000
Lockage 260 feet, at \$ 1,250 a foot,	325,000
Feeders, purchase of land, &c.	145,000
	<hr/>
	1,250,000
	<hr/>

II. NEW JERSEY CANAL.

A COMPANY was incorporated some years ago, by the legislature of New Jersey, for opening a canal between the Rariton and the Delaware. Acting under the erroneous opinion that the navigation of small rivers might be improved and used as a canal, the company intended to have united, by a cross cut of one mile, the Assampink or Trenton Creek, with Stoney brook, a branch of Millstone river, and to have descended Trenton creek to the Delaware, and Stoney brook, and Millstone river, to the Rariton. The capital, which was inadequate, was not paid ; but their survey of the intended route, has shewn the practicability of a canal for sea vessels, on a proper plan.

The distance from Brunswick to Trenton is 26 miles, and the only obstacle in the way is the " Sand hills," some distance west of Brunswick. These may, it is said, be avoided by a deviation which would not encrease the distance more than two miles ; and they may at all events be perforated, as has been

done by the turnpike company, who have opened a road on a straight line between the two towns, without having in any place an angle of ascent of more than three degrees.

The highest intermediate ground between Assampink and Stoney brook, is only fifty feet above tide water; and it is suggested that the summit level may be taken seven feet lower, cutting seven miles through a level meadow, between the confluence of the Assampink, and Shippetankin creeks, and Rowley's mill, near the confluence of Stoney brook and Millstone river.

An adequate supply of water will be drawn by short feeders, from Philip's springs, Trenton creek, Stoney brook, and Millstone river, all of which are more elevated than the route of the canal, the "Sand hills" excepted.

The depth of water at the two extremities of the canal, taken at low water, are feet at Brunswick, and ten feet at Lamberton, one mile below Trenton.

The expenses may be estimated as followeth :

Digging 28 miles, at \$ 20,000 per mile,	560,000
Lockage, 100 feet, (probably less) at	
\$ 1250 per foot, - - - -	125,000
Feeders, purchase of land, and water	
rights, - - - - -	115,000
	<hr/>
	\$ 800,000
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III. DELAWARE AND CHESAPEAKE CANAL.

A COMPANY incorporated by the states of Delaware and Maryland, for opening this canal, has commenced its operations, now suspended for want of funds.

The canal will commence at Welsh point on Elk river, an arm of the Chesapeake, and terminate at a distance of 22 miles, on Christiana creek, a branch of the Delaware. At low water the depth of water in Christiana is nine feet, and in Elk twelve feet,

within one hundred feet from the shore. The tide rises four feet in both rivers. The canal might, without encreasing the distance, be conducted to New Castle on the Delaware itself, instead of ending at Christiana creek.

The highest intermediate ground, over which the canal will be carried on a level of 13 miles in length, is 74 feet above tide water, the descent being effected by nine locks on each side. The digging is generally easy: no expensive aqueducts or bridges, nor any other obstacles but those which have already been overcome in digging the feeder through a very rocky soil.

The supply of water drawn from Elk river, by a feeder six miles in length, already completed, which is itself a boat canal three and a half feet deep, united by a lock of ten feet lift with the main canal, is calculated to fill daily 144 locks; a quantity sufficient on an average for the daily passage of twenty four vessels. A reservoir covering thirty, and which may be encreased to 150 acres, will supply occasional deficiencies: other reservoirs may be added, and Christiana and White Clay creeks may hereafter be brought in aid of Elk river, if the supply should prove too scanty for an encreased navigation.

The canal 26 feet wide at the bottom, and 50 at the top on the water line, being dug at the depth of 8 feet, is intended for vessels of forty to 70 tons, drawing 7 1-2 feet water: but the banks twenty feet wide for towing paths, and one of which may be converted into a turnpike road, being raised three feet above the level of the water, will, by encreasing the height of the lock gates one foot, admit a depth of nine feet of water in the canal; at which depth it would perhaps be eligible to dig at once. The locks 80 feet long, 18 feet wide, and 8 (or 9) feet deep over the gate-sills, containing each 11,500 to 13,000 cubic feet of water, and with a lift of 8 to 9 feet each, will be constructed of hewn stone laid in tarras. Those dimensions both of the canal and locks, recommend-

ed by Mr. Latrobe, the engineer of the canal, may be adopted in all the other canals for sea vessels, on this line of communication.

The present annual carriage across the peninsula, which would be drawn through the canal, is estimated at forty two thousand tons, exclusively of passengers. This will be greatly encreased by the facility which the canal itself will afford to the commercial intercourse between the two bays, and to the conveyance of articles now carried through other channels, or too heavy for transportation, at the present expense of carriage. The coals wanted for Philadelphia, and which brought down from the sources of the Susquehanah and Potomac, but principally from the vicinity of Richmond, would naturally pass through the canal, have been alone estimated at more than one hundred thousand tons a year. The annual carriage of all articles may, in the present state of population, be fairly estimated at one hundred and fifty thousand tons, and the direct annual saving to the community at 300,000 dollars, being at the rate of 2 dollars a ton for the difference between land and water carriage across the peninsula, after paying the tolls. These, at the rate of fifty cents a ton, will give to the undertakers a revenue of 75,000 dollars, leaving, after a deduction of 10,000 dollars for annual repairs, and of 10,000 dollars more for attendance and contingencies, a nett income of 55,000 dollars.

The expenses of the whole work are estimated as followeth :

Digging 22 miles, at \$ 20,000 a mile,	\$ 440,000
18 locks, at 10,000 dollars each,	180,000

(The whole lockage being 148 feet,
would at \$ 1250 a foot, amount to
185,000 dollars.)

Feeder, (nearly completed,) reservoirs, lock at the feeder, purchase of water rights and land, including a debt of dollars due by the company,	230,000
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Dollars,	<u>850,000</u>
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The interest on which sum, at 6 per cent. is 51,000 dollars.

The capital originally subscribed amounted to four hundred thousand dollars, divided into two thousand shares, of two hundred dollars each. One half of these has been forfeited after a small payment of five dollars on each share. One hundred thousand dollars paid by the other stockholders, have been expended in preparatory measures, in the purchase of water rights, and in digging the feeder, which was considered as the most difficult part of the work. Seven hundred and fifty thousand dollars are still wanted to complete the work; of which sum, one hundred thousand dollars is payable by the stockholders, and the deficiency of 650,000 dollars, must be drawn from other sources.

IV. CHESAPEAKE AND ALBEMARLE.

1. THE shortest communication between the Chesapeake and Albemarle sound, is from North landing at the head of the tide of North West river, which empties into Currituck inlet, the easternmost arm of Albemarle, to either Kempsville or Great Bridge, at the head of the tide of two different branches of the South branch of Elizabeth river, which passing by Norfolk, unites at Hampton roads, with James river, and the Chesapeake. The distance is stated at seven miles, and the levels said to be favorable. It is believed that the principal reason why this communication has not been attempted, is a bar in Currituck inlet, which does not admit the passage of vessels drawing five feet water.

2. A company incorporated by the states of Virginia and North Carolina, for opening a canal through the Dismal swamp, has made considerable progress in the work.

The canal extends 22 miles in length from Deep creek, a branch of the South branch of Elizabeth river; 7 miles above Norfolk, to Joyce's creek, a branch of Pasquotank river, a northern arm of Al-

bemarle sound. Vessels drawing 8 to 9 feet water may ascend both creeks to each extremity of the canal.

The intervening ground along the eastern margin of the Dismal swamp, is almost level, the rise towards the middle not exceeding two feet above the two extremities, which are only 18 feet and 9 inches above tide water. The digging is very easy; the only obstacles arise from the stumps and roots of trees, and are nearly overcome; and a single aqueduct or rather culvert over a small run emptying into the North West river is necessary.

The swamp itself supplies at the depth at which the canal is cut, the water which has heretofore been wanted; and a sufficient supply may be drawn by a feeder of 3 miles and a half in length, cut through a perfect level from lake Drummond, a natural reservoir in the center of the swamp, of fifteen miles in circumference, and about six feet higher than the water in the canal.

The canal as cut by the company is 24 feet wide, and 6 feet deep, with one bank on the west side for a towing path, 18 feet broad. The whole digging, with the exception of two miles which must be deepened 3 feet, and of three quarters of a mile in another place not entirely finished, has been completed. The locks at the two extremities of the canal are not built; but two have been erected at some distance from each extremity; probably in order to save some digging in the intervening space: they are made of square juniper logs, and have cost only three hundred dollars each.

The expense of digging has not exceeded 4,000 dollars a mile; the whole capital expended, amounts to one hundred thousand dollars, of which the state of Virginia has furnished 17,500; and it is stated that the whole work may be completed in one year, and will not, including the locks and the payment of some debts contracted by the company, exceed 25,000 dollars. But the canal, which by the original

act of incorporation was to be 32 feet wide, and 8 feet deep, can on its present plan be considered only as a local object, the principal utility of which consists in bringing to market the otherwise useless lumber of the swamp. The only boats which navigate it are flats, forty feet long, six feet wide, drawing two feet of water and carrying eight thousand shingles.

It must, in order to become a national object, be capable of receiving the vessels which navigate Albemarle sound, and for that purpose be restored to its first intended dimensions, or rather be widened and deepened, on the plan adopted for the Chesapeake and Delaware canal. The expense would be as followeth :

Digging, deepening to 8 feet, preserving the same level the whole way, and widening to a proper breadth, 22 miles, at 8,000 dollars a mile, -	\$ 176,000
4 Stone locks at \$ 10,000, - -	40,000
Feeder to lake Drummond, aqueduct and contingencies, - - -	34,000
	<hr/>
	\$ 250,000

3. The last mentioned canal is in the most direct line of the communication through Albemarle to Pamlico sound, and the adjacent Southern sounds. It has been objected, that the navigation of Pasquotank river was intricate, and that it would be more advantageous to open a communication with Chowan river, which passing by Edenton, and then uniting with the Roanoke, forms Albemarle sound.

A company was incorporated for that purpose ; but the capital was not filled, and no other operation performed, but surveying the ground. The intended canal on that route, would commence at Suffolk, on Nansemond river, which empties into James river, a few miles above, and west of the mouth of Elizabeth river; and passing along the western margin of the Dismal swamp, would reach at a computed dis-

tance of thirty miles, Gates' court house on Bennet's creek, a branch of Chowan river, which vessels drawing ten feet of water may ascend to that spot.

The highest intermediate ground is 28 feet above tide water and consequently higher than the surface of lake Drummond. But Bennet's creek and Curripeake swamp were considered as affording a sufficient supply of water. Should this prove adequate, the principal objection to this route will be, that the canal lands at Suffolk instead of Norfolk. This consideration, and the capital already expended on the canal from Elizabeth river to Pasquotank, seem to give a preference to this course. To which may be added, that if it be preferable to strike the waters of Chowan river, a lateral canal may be hereafter opened, along the southern margin of the Dismal swamp, from the southern extremity of the Elizabeth and Pasquotank canal, to Bennet's creek or Edenton. Whatever route may, after a critical examination of the ground, be thought the most eligible, the opening of this communication will be more easy and less expensive than either of the three northern canals.

The following table is a recapitulation of the distance to be cut on the whole line, and of the estimated expense.

CANALS.	DIRECTION.	Distance. <i>Miles.</i>	LOCKAGE <i>Feet.</i>	EXPENSE. <i>Dollars.</i>
Massachusetts,	Weymouth to Taunton,	26	260	1,250,000
New Jersey,	Brunswick to Trenton,	28	100	800,000
Delaware and } Chesapeake, } Chesapeake & } Albemarle, }	Christiana to Elk,	22	148	750,000
	Eliz. riv. to Pasquotank	22	40	250,000
Total.		98	548	3,050,000

COMMUNICATIONS BETWEEN THE ATLANTIC AND WESTERN WATERS.

THE Apalachian mountains, to use an ancient generic denomination, extend in a direction west of south, from the 42d to the 34th degree of north latitude, approaching the sea, and even washed by the tide in the state of New York, and thence in their southerly course, gradually receding from the sea shore. Viewed as a whole, their breadth may be estimated at 110 miles, and they consist of a succession of parallel ridges, following nearly the direction of the sea coast, irregularly intersected by rivers, and divided by narrow vallies. The ridge, which divides the Atlantic rivers from the western waters, generally known by the name of Allegheny, preserves throughout a nearly equal distance of 250 miles from the Atlantic ocean, and a nearly uniform elevation of 3,000 feet above the level of the sea.

Those mountains may, however, be perhaps considered as consisting of two principal chains: between these lies the fertile lime-stone valley, which, although occasionally interrupted by transversal ridges, and in one place, by the dividing or Allegheny ridge, may be traced from Newburgh and Esopus, on the Hudson river, to Knoxville on the Tennessee.

The eastern and narrowest chain is the Blue Ridge of Virginia, which in its north east course traverses under various names, the states of Maryland, Pennsylvania, and New Jersey, forms the high lands broken at West point by the tide of the Hudson, and then uniting with the Green mountains, assumes a northerly direction, and divides the waters of the Hudson, and of lake Champlain, from those of Connecticut river. On the borders of Virginia and North Carolina, the Blue Ridge is united by an inferior mountain, with the great western chain, and thence to its southern extremity, becomes the principal or

dividing mountain, discharging eastwardly the rivers Roanoke, Pedee, Santee, and Savannah, into the Atlantic ocean; southwardly the Chatahouchee, and the Alabama into the gulph of Mexico, and westwardly the New river and the Tennessee. The New river, taking a northwardly course, breaks through all the ridges of the great western chain, and at a short distance beyond it, unites under the name of Kanhawa, with the Ohio. The Tennessee pursues, at first, a south west direction between the two chains, until having reached, and in a westwardly course turned the southern extremity of the great western chain, it assumes a northwardly direction, and joins its waters with those of the Ohio, a few miles above the confluence of that river with the Mississippi.

The western chain, much broader, and generally more elevated, is known under the names of Cumberland and Gauley mountains, from its southern extremity, near the great bend of the Tennessee river, until it becomes in Virginia, the principal or dividing mountain. Thence in its northerly course, towards the state of New York, it discharges westwardly the Green Briar river, which, by its junction with the New river, forms the Kanhawa, and the rivers Monongahela and Allegheny, which, from their confluence at Pittsburgh, assume the name of Ohio. Eastwardly it pours into the Atlantic ocean, James river, the Potomac, and the Susquehannah. From the northernmost and less elevated spurs of the chain, the Genessee flows into the lake Ontario; and in that quarter the northerly branches of the Susquehanna seem to take their source, from amongst inferior ridges, and in their course to the Chesapeake, to break through all the mountains. From the Susquehannah, the principal chain assumes a more eastwardly direction, and washed on the north by the lateral valley of the river Mowhawk, whilst it gives rise southwardly to the Delaware, it terminates under the name of Catskill mountain, in view of the tide water of the Hudson.

This description has been introduced for the double purpose of pointing out all the rivers which can afford the means of communication, and of shewing the impracticability, in the present state of science, of effecting a canal navigation across the mountains.

The most elevated lock canal of which a correct description has been given, is that of Languedoc, and the highest ground over which it is carried, is only six hundred feet above the sea. It is not believed that any canal has been undertaken, or at least completed in England, of an elevation exceeding 430 feet above the waters united by it. The Allegheny mountain is generally, and from observations made in several places, about 3,000 feet above the level of the sea. The precise height of the dividing ridge was ascertained by the commissioners, who laid out the United States road from Cumberland on the Potomac to Brownsville on the Monongahela, at 2260 above the first, and at 2150 feet above the last river. Cumberland, from the levels taken by the Potomac company, is itself 735 feet above tide water. Although some more advantageous and less elevated places may be found, particularly amongst the ridges which divide some of the upper branches of the Susquehannah from the corresponding streams emptying into the river Allegheny, there is none which is not of an elevation much beyond what has ever been overcome by canals in any other country. The impracticability arises from the principle of lock navigation, which in order to effect the ascent, requires a greater supply of water in proportion to the height to be ascended, whilst the supply of water becomes less in the same proportion. Nor does the chain of mountains through the whole extent, where it divides the Atlantic from the western rivers, afford a single pond, lake or natural reservoir. It may be added as a general feature of American geography, that except in the swamps along the southern sea coast, no lake is to be found in the United States, south of 41 degrees north latitude; and that almost

every river, north of 42 degrees, issues from a lake or pond.

The works necessary in order to facilitate the communications from the sea ports across the mountains to the western waters, must therefore consist either of artificial roads extending the whole way from tide water, to the nearest and most convenient navigable western waters; or of improvements in the navigation of the leading Atlantic rivers, to the highest practicable points, connected by artificial roads across the mountains, with the nearest points from which a permanent navigation can be relied on, down the western rivers.

The principal considerations in selecting proper directions for those communications, are, the distance from the navigable western waters, both to tide water, and to the nearest navigable Atlantic river, and the extent of navigation, either natural or susceptible of improvement, which may be afforded by the rivers. Distance alone is mentioned, so far as relates to roads, because the mountains however insuperable for canals, offer no important impediment to land communications. So far from being an insurmountable barrier to commercial intercourse, between the two great sections of the union, it is now ascertained that those mountains may almost in every direction be crossed by artificial roads, as permanent, as easy, and less expensive, than similar works in the lower country. For congress having, contrary to current opinion, directed that the road from Cumberland to Brownsville should be laid out so that its ascent should not in any place exceed an angle of five degrees with the horizon; no difficulty has been experienced in effecting the object without cutting through hills, and although the road thus laid out, be in a distance of 72 miles, two or three miles shorter than that heretofore in use.

Although the distance from the sea to the principal dividing mountain through its whole length, between the western sources of the Susquehannah, and

those of the Savannali, be nearly the same, yet the Atlantic bays, penetrating the coast at different depths, and in different directions, the distances from the sea ports to the nearest western navigable waters, vary considerably. Taken in straight lines from each port to the nearest branch, beyond all the mountains, of each of the four great western rivers, they may be stated as follows :

From Philadelphia to the confluence of Conemaugh and Loyalhannon, branches of the <i>Allegheny</i> , - - -	<i>Miles</i> 220
From the City of Washington to the con- fluence of the rivers <i>Monongahela</i> and Cheat, - - -	150
From Richmond to Morris's on the <i>Kanhawa</i> , below all the falls of that river, - - -	210
From Savannah or Charleston to any navigable branch of <i>Tennessee</i> , the dis- tance exceeds - - -	300

The distance from the same western points, to the upper navigation of the corresponding Atlantic rivers, cannot be stated with precision, as the upper points to which the navigation of those rivers may be improved, is not yet ascertained. The shortest portage between the waters of the Potomac, and those of the Monongahela, in their natural state, from West Port on the Potomac, to Cheat river below the falls, is about fifty miles in a straight line. But in order to secure a tolerable navigation, particularly on the Potomac, the route from Cumberland to Brownsville, (Red Stone old fort) has been preferred, and the distance by the road lately laid out is 72 miles. The portage between the North fork of the Juniata, a branch of the Susquehanna, and the corresponding waters of the river Allegheny, is somewhat shorter. That between Pattonborough, on James river, and the falls of the Kanhawa, exceeds one hundred miles.

The most prominent, though not perhaps the most insuperable obstacle in the navigation of the Atlantic

rivers, consists in their lower falls, which are ascribed to a presumed continuous granite ridge, rising about 130 feet above tide water. That ridge, from New York to James river inclusively, arrests the ascent of the tide; the falls of every river within that space being precisely at the head of the tide. Pursuing thence southwardly a direction nearly parallel to the mountains, it recedes from the sea, leaving in each southern river, an extent of good navigation between the tide and the falls. Other falls of less magnitude are found at the gaps of the Blue Ridge, through which the rivers have forced their passage. Higher up the rapidity of the northern rivers, which penetrate through the inferior ridges of the great western chain, encreases as they approach, the dividing or Allegheny mountain; and their sources being nearly at the same elevation, their rapidity encreases in proportion to the shortness of their course. For that reason the navigation of the Susquehannah above the Blue Ridge is better than that of the Potomac, which affords as has been stated, the shortest communication from tide water to the nearest western river. The levels of the last mentioned river having been taken by the Potomac company, the general result is annexed, as giving a more correct idea of the navigation of the Atlantic rivers, than could be conveyed in any other manner.

	DISTANCE.	FALL.	RATE OF FALL.
	<i>Miles.</i>	<i>Feet.</i>	<i>Feet pr. mile.</i>
From the mouth of Savage river, down to Cumberland,	31	445	14 1-2
Thence to the Blue Ridge,	130 1-2	490	4 1-2
Harper's Ferry, or Shenandoe Falls,	5 1-2	43	
Thence to Great Falls, . . .	40	39	1
Great and Little Falls, to tide water,	12	143	
Total,	219	1,160	

The papers marked (C.) contain the information which has been collected respecting the works executed or contemplated on the great rivers already enumerated. It has not been understood that any improvements of importance had been yet attempted on the Savannah and Pedee, nor on any of the tributary streams of the Ohio; and the communications received under this head, relate only to the Santee, Roanoke, James river, Potomac, Susquehannah, and Ohio.

I. SANTEE.

THE Santee or Catawba, is said to be occasionally navigable for near 300 miles, as high up as Morgantown, in North Carolina. Two companies have been incorporated by that state, and that of South Carolina, for the purpose of improving its navigation. The lower falls are above Camden and not far from the arsenal of the United States, at Mount Rock. A canal had been commenced there, but either from want of success in the commencement, or from want of funds, the work appears to be suspended. The market for the produce brought down that river is Charleston; and the river boats were obliged at the mouth of the river to enter the sea, and to reach that port by a navigation along the sea shore, for which they were not calculated. To remedy that inconvenience, and to insure a permanent navigation, a canal has been opened by another company, uniting the Santee with Cooper river, which empties into the harbor of Charleston.

The distance between the points united, is 22 miles: the highest intervening ground was 52 feet above Santee, and 85 feet above the river Cooper; but it has been reduced 17 feet by digging; the descent to Santee being 35 feet, effected by four locks, and that to Cooper 68 feet, effected by nine locks.

The principal supply of water is afforded by

springs arising from the marshy ground at the bottom of the canal, and by several drains which collect and bring from an adjacent swamp the sources of the river Cooper. The quantity is said to be seldom deficient; yet a steam engine has been contemplated as perhaps necessary in order to raise from the Santee an adequate supply.

The canal was carried over some small streams by means of aqueducts; inconsiderable ravines have been filled, and the ground was dug in some places to the depth of sixteen feet, in order to preserve the level. But it appears that the roots of trees were the greatest obstacle encountered in digging the canal. Its breadth is 20 feet at the bottom, and 35 feet at top: the depth of water is 4 feet; and it admits boats of 20 tons. The locks made of brick, faced with marble, are 60 feet long, and 10 feet wide.

The capital expended is stated at 650,667 dollars, including sixty negroes and some tracts of land belonging to the company. The canal has been completed six years; the annual tolls had never exceeded 13,000 dollars before the year 1807, and the annual expenses are stated at 7,000 dollars. The want of success in this undertaking, which though completed is very unprofitable, may be ascribed to several causes. The expense compared with the work is much greater than might have been expected, and probably than was necessary. The locks are too small for large boats, which are therefore obliged to pursue the former route down the Santee, and by sea to Charleston; and want of water is alledged as a sufficient reason for the size of the locks. But a canal in that situation cannot in America be profitable unless the navigation of the main river with which it communicates, is rendered safe and permanent; and whenever that of the Santee itself shall have been improved, the utility and profits of the canal will be considerably encreased.

II. THE LOWER OR GREAT FALLS OF ROANOKE,

CONSIST in a succession of rapids, which in a distance of fifteen miles have a fall of ninety three feet. This obstruction is such that almost all the tobacco of that river is transported by land to Petersburg, on the Appomatox branch of James river. A canal has been contemplated from the upper end of the falls to Murfreesborough, situated on the tide water of a branch of Chowan river, 25 miles above the mouth of Bennet's creek, which has been before mentioned as one of the lines of communication between Albemarle sound and the Chesapeake. The level is said to be favorable, without any obstructions or vallies in the way. The distance is 38 miles, and the expense of a small canal for boats, drawing 2 feet and a half of water, may be estimated as followeth :

Digging 38 miles, at \$ 6000 a mile, -	\$ 228,000
Lockage 93 feet, at \$ 800 a foot, - -	74,400
Feeder, land, &c. - - -	47,600

Dollars, 350,000

The capital for this canal has never been subscribed, and it has been suggested that it would be practicable to open one to Petersburg. It is not believed that any hills intervene in that course ; and the greatest obstacle will be found in crossing the branches of Chowan river.

III. JAMES RIVER.

A COMPANY incorporated by the state of Virginia, for the improvement of the navigation of the river generally, has removed some obstructions in the upper part of the river, and is bound by the charter to render it so far navigable that there may never be less than 12 inches of water over any of the shoals or rapids, from the upper end of the lower or great falls to Pattonborough, a distance of 220 miles. The

natural navigation of the river through that extent is considered as better than that of any other Atlantic river above the falls.

A communication has been opened by the company from Westham, at the upper end of the great falls, to Shockoe hill in the city of Richmond, in the following manner: The water is drawn at Westham from the river into a canal 200 yards in length, at the end of which, boats descending 34 feet through three locks re-enter the river, and after using its natural navigation three miles, are brought by a canal 3 miles and a half in length to a bason on Shockoe hill, where the navigation terminates.

That bason is about 80 feet above tide water, and one mile and a half from Rockets, the port of Richmond. The whole fall from the upper end of the canal at Westham to the bason, may be stated at 48 feet, and the distance at six miles and a half. The canal is 25 feet wide, and admits boats of eight tons drawing three feet of water. The locks 80 feet long, and 16 feet wide, are of solid masonry; but the cement is defective. Three aqueducts have been thrown across valleys intervening in the course of the canal; and some difficult digging was necessary on the side of hills, and through ledges of rocks.

The canal, according to the charter, was intended to have been brought down to tide water. The performance of that condition is now suspended by an act of the legislature of Virginia, and there seems to be a considerable diversity of opinion on that subject. In a national point of view, the plan which will at the least expense put coals on board vessels lying at Rockets, deserves the preference. For coal is in no other part of the United States found in abundance in the vicinity of tide water. At present the expense of transportation by the canal is already reduced to one third of the land carriage.

The original capital of the company amounted to 140,000 dollars, of which the state of Virginia owns fifty thousand; and 91,000 dollars arising from the

proceeds of tolls, had before the 1st January, 1805, been applied to the work, making together an expenditure of 231,000 dollars. The annual tolls raised on fourteen thousand tons of country produce, and on two thousand coal boats, have amounted to 16,750 dollars : and the annual repairs and expenses are estimated at 5000 dollars. But as the company draw also a revenue from the rent of water, applied to mills and other water works erected along the canal, they have been able in some years to make dividends of 16,800 dollars, being at the rate of 12 per cent. on the original capital, but of only about 7 per cent. if calculated on the sum of 244,000 dollars, the amount of capital expended, and interest accrued before any dividend was made.

IV. POTOMAC.

THE company incorporated by the states of Maryland and Virginia, for improving the navigation of that river, has executed the following works.

1. At a distance of 12 miles above the head of the tide, which ascends about 3 miles above the city of Washington, the river is 143 feet higher than tide water. At that place designated by the name of *Great falls*, the boats passing through a canal one mile in length, six feet deep, and twenty five feet wide, descend 76 feet by five locks, 100 feet long, and 12 feet wide each, and re-entering the river, follow its natural bed, eight miles and a half. Another canal of the same dimensions, and two miles and a half in length, brings them then through three locks and by a descent of 37 feet to tide water. This last fall is distinguished by the name of *Little falls*. The two lower locks of the *Great falls*, excavated out of the solid rock, have each a lift of 18 feet : the three upper locks of solid masonry are of unequal height, and have together a lift of forty feet. The three locks of the *Little falls*, are each one hundred feet in length and eighteen feet wide. That breadth is unnecessary, and consumes too much water, a de-

fect which will be remedied, when stone locks will be substituted to those now in use, which being of wood, will soon be decayed.

Three other canals without locks have been opened around three distinct falls: the principal at the Shenandoe falls below Harper's ferry, and at the place where the Potomac breaks through the Blue Ridge, is one mile in length around a fall of fifteen feet. Between this and the Great falls another canal three quarters of a mile in length, is opened around the Seneca falls. The third, fifty yards in length, has been cut around Houre's falls, five miles above the Shenandoe falls. Above this place, the navigation has been improved by deepening occasionally the channel, raising the water in shallow places by small dams, and opening sluices along the shore. It is believed that by multiplying the number of those low dams, by throwing the channel along the shore, and when necessary opening canals with or without locks around the principal rapids, the navigation may be improved, perhaps as high up as Cumberland, 188 miles above tide water, to such a degree as to render the river passable for boats the greater part of the year. And if this be found practicable on the Potomac, which is the most rapid of the great Atlantic rivers, the same improvements may with greater facility be effected on any of the others. It will be indispensable, in order to attain that object on the Potomac, that additional canals with locks, should be opened at the Shenandoe or Blue Ridge falls, which as has already been stated, fall 43 feet, in the distance of five miles.

2. The Shenandoe, a river nearly as large as the Potomac itself, after a course of 250 miles through the Great Lime-stone valley, unites its waters with those of the Potomac at Harper's ferry, just above the Blue Ridge. From Port Republic till within eight miles of the Potomac, a distance of near 200 miles, it affords a good navigation, the fall of the river being at the rate of less than two feet a mile. In the

last eight miles it falls eighty feet, and was impassable before the improvements completed last year by the Potomac company. Six different canals, 20 feet wide, four feet and a half deep, and extending altogether 2400 yards, have been opened round the most difficult falls. Through those, and five stone locks, 100 feet long and 12 feet wide each, and effecting together a descent of near fifty feet, the communication is now opened, and will render the undertaking much more productive than heretofore. The water in all those canals and locks, as well as in those executed on the Potomac, is uniformly supplied by the river itself.

The capital originally subscribed amounted to 311,560 dollars, divided into 701 shares; of which the state of Maryland owns 220, and the state of Virginia seventy. The total amount expended, including an additional payment received from late subscribers, 38,000 dollars arising from tolls, which have been applied to the work, and a debt of about 67,000 dollars contracted by the company, amounts to 444,652 dollars. The annual tolls raised on eight thousand tons of sundry articles, valued at more than half a million of dollars, have not before the opening of the Shenandoe, exceeded 15,000 dollars; and the annual expenses and repairs are stated at 5,000 dollars.

One hundred shares of £. 145 sterling each, remain open for subscription.

V. SUSQUEHANNAH.

THIS river has no perpendicular or altogether impassable falls: but from the head of the tide up to the Pennsylvania line, a distance of ten miles, the navigation is impeded by a succession of dangerous rapids; and these, though occasionally separated by sheets of smooth water, continue 40 miles higher up, at least as far as Columbia; the whole fall from this place, to the head of the tide, being estimated at about

140 feet. The navigation through that distance, at all times dangerous, is practicable only during the high freshets, when rafts and flat bottomed boats, 80 feet long and 17 feet wide, may descend from the several widely extended upper branches of the river. Less dangerous falls are found at the place where it breaks through the Blue Ridge; above which the natural navigation from Middletown upwards, whether up the Juniata, the West branch, or the East branch, is much better than that of the Potomac, and has been improved in several places at the expense of the state of Pennsylvania. A canal one mile long, and 4 feet deep, with two brick locks, has also been opened around the Conewago falls, in the gap of the Blue Ridge, fourteen thousand dollars having been paid for that object by the same state. Its entrance is difficult, and it is used for water works, being free for navigation, though private property. From Columbia down to the Maryland line, considerable improvements in the bed of the river have also been made at the expense of the two states, and the descending navigation has on the whole been improved: but few boats ever attempt to ascend. Nor is it believed that the natural advantages of the most considerable Atlantic river will ever be fully enjoyed, until a canal shall have been opened the whole way from Columbia, either to tide water, or to the Delaware and Chesapeake canal.

A company incorporated by the state of Maryland, for opening a canal around the falls, in that part of the river which extends from the Pennsylvania line, to tide water, has completed that part of the work, the utility of which is but very partially felt, whilst the bed of the river remains the only communication from its upper extremity up to Columbia.

The canal, 30 feet wide, 3 feet deep, and admitting boats of 20 tons, is nine miles in length, with a fall of 59 feet. The descent is effected by eight stone locks, each of which is 100 feet in length, and 12 feet wide. The water is supplied by the river itself; and

in order to cross the rivers Conawingo and Octorara, these, by means of dams, have been raised ten and twelve feet to the level of the canal.

Its defects consist in the want of sufficient breadth of the locks, which do not admit the rafts and wide flat bottom boats, generally used in bringing down the country produce, and in want of water at the lower end of the canal. This last defect may be remedied by extending the canal 700 yards lower down along the edge of the river ; and it is probable, that as timber will become more scarce and valuable in the upper branches of the Susquehannah, boats of a different construction will be used. In the mean while, the annual tolls have not yet amounted to one thousand, whilst the annual expenses are stated at twelve hundred dollars, and the capital expended at 250,000 dollars.

The attempts made to open a communication from Middletown, in the Lime stone valley, to Philadelphia, partly by canals, and partly by means of the Skuylkill, will be noticed under the head of "Interior Canals."

VI. OHIO.

THE navigation of the Kanhawa, and of the eastern branches of the Tennessee, Monongahela, and Allegheny, in their course through the mountains, may at a future period be improved. But from the foot of the mountains, all those rivers, and particularly the Ohio, flow with a much gentler current than the Atlantic rivers : a circumstance easily accounted for, when it is recollected that Brownsville on the Monongahela, and at a distance of two thousand miles by water from the sea, is only 115 feet more elevated than Cumberland on the Potomac ; whilst this river with all its meanders, reaches tide water, within less than two hundred miles. All those rivers at the annual melting of the snows rise to the height of more than forty feet, affording from the upper points to which they are navigable, a safe navigation to the

sea for any ship that can pass over the bar at the mouth of the Mississippi. As early as the year 1793, a schooner built on the Monongahela, between Brownsville and Pittsburgh, reached New Orleans by that extraordinary inland navigation, and arrived safely at Philadelphia. This first essay, stimulated the spirit of enterprize so conspicuous in the American character; and numerous vessels from one hundred to three hundred and fifty tons burthen are now annually built at several ship yards on the Ohio, even as high up as Pittsburgh, and bringing down to New Orleans the produce of the upper country consumed there, carry to Europe, and to the Atlantic ports of the United States, the sugar, the cotton, and the tobacco of Louisiana, and of the states of Tennessee and Kentucky.

That branch of national industry gives value to the immense forests of the Ohio and of its numerous branches, will soon make a considerable and perhaps necessary accession to the shipping of the United States, and has a tendency to diminish the price of freights from New Orleans to the other American and to foreign ports. The importance of this last consideration will be duly felt, if the magnitude of the exports, of which New Orleans is destined to be the emporium, be contrasted with the probable amount of its importations. For such are the labor, time and expense necessary to ascend the rapid stream of the Mississippi; and the nature of its banks annually overflowed on a breadth of several miles, precludes the possibility of towing paths; that whilst the greater part of the produce of the immense country watered by that river and its tributary streams, must necessarily be exported through its channel, the importations of a considerable portion of that country will continue to be supplied from the Atlantic sea ports, by water and land communications, susceptible of considerable improvement. And thus unless another outlet be found for a portion of the

exports, or unless the upper country can supply vessels, those exports must necessarily pay a double freight.

The only impediments to that navigation are, on the Tennessee, "the Muscle shoals," of which no particular account has been received; and, on the Ohio, the falls of Louisville. Ordinary boats can with difficulty pass these in summer, and the navigation is even during the freshets, dangerous for the large vessels. The attention of the legislature of Kentucky, and of the inhabitants of the western country generally, has therefore been particularly drawn to the opening of a canal at that place. A company has been lately incorporated by the state of Kentucky for that purpose, with a capital which may amount to 500,000 dollars, but a small portion of which has yet been subscribed. The expense however is estimated at a sum less than the nominal capital.

The proposed canal would be near two miles in length, and must be dug, in some places to a depth of 27, but generally of about 16 feet; the breadth at the bottom being 20 feet with the necessary slope, would make it generally 68 feet wide at top, and in particular places not less than one hundred. The fall at low water is about 22 feet, and would require three locks of dimensions sufficient to pass ships of 400 tons, and drawing 14 feet of water. The greatest expense will be that of digging and removing the earth, which may be estimated at 400,000 cubic yards, and according to the representation made of the nature of the ground, will not probably cost more than 200,000 dollars. To this may be added 100,000 dollars for the locks and other necessary works, making altogether three hundred thousand dollars. The greatest difficulty seems to be the protection of the locks and canals against the rise of the river, which sometimes overflows the whole ground through which the canal must be opened.

THE expense of the improvements suggested in the communications between the Atlantic and western waters, may be stated as followeth:

1st. Four artificial roads from the four great western rivers, the Allegheny, Monongahela, Kanhawa, and Tennessee, to the nearest corresponding Atlantic rivers, the Susquehannah or Juniata, the Potomac, James river, and either the Santee or Savannah, leaving to the several states the continuation of those roads eastwardly to the nearest sea ports. Those roads should unite on each river, points from which a permanent and safe navigation downwards could, except during the driest seasons, be relied on, and will therefore on each route be estimated at one hundred miles, making altogether 400 miles, which at 7000 dollars a mile, the materials being generally on the spot, would cost - - - \$ 2,800,000

2dly. The improvement of the navigation of the four Atlantic rivers from tide water to the highest practicable point, effected principally by canals around the falls wherever practicable, and by locks whenever necessary. The most expensive of these would be the proposed canal from Columbia on the Susquehannah, either to tide water, or to the Delaware & Chesapeake canal. And considering how much has been effected already, and may still be done on the other rivers by the several incorporated companies, it is believed that every useful improvement might be completed by a public expenditure not exceeding \$ 1,500,000

3dly. The canal at the falls of Ohio, estimated at - - - - - \$ 300,000

Making altogether, - - - \$ 4,600,000

Although a canal navigation, uniting the Atlantic and western waters in a direct course across the

mountains appears impracticable, yet those mountains may be turned either on the north by means of the Mohawk valley and of lake Ontario, or on the south through Georgia, and the Mississippi territory. The first communication will be noticed under the head of "the river St. Laurence and great lakes." Of the second it will be sufficient to observe, that the country lying between the sources of the rivers Chatahouchee and Mobile, and the gulph of Mexico, is an inclined plane, regularly descending towards the sea, and that by following the proper levels, it presents no natural obstacle to the opening of a canal, fed by the waters of the two last mentioned rivers, and extending from the tide water on the coast of Georgia, to the Mississippi. The distance in a direct line is about 550 miles, and to be overcome, requires only time, perseverance and labor. When it is recollected that such an undertaking would discharge the Mississippi into the Atlantic, the remarks already made on the trade of that river, and other obvious considerations, will sufficiently point out its immense importance. Nor should the plan, on account of its magnitude, be thought chimerical; for the elevation and other natural obstacles of intervening ground, or want of a sufficient supply of water, and not distance, are the only insuperable impediments to an artificial navigation.

This work, which is presented not as an immediate but as a distant object, worthy of consideration, would probably require ten millions of dollars, and thirty years for its completion. The annual sales of the public lands in the Mississippi territory, which are estimated at fifty millions of acres, would after paying the debt due to the state of Georgia, afford sufficient funds; and the increased value of the residue, would alone more than compensate the expense.

It is proper to add, that an inland navigation, even for open boats, already exists from New Orleans by the canal Carondelet, to the lake Pontchartrain, thence between the coast and the adjacent islands to

the bay of Mobile, and up its two principal rivers, the Alabama, and the Tombigbee to the head of the tide within the acknowledged boundaries of the United States. The current of these two rivers being much less rapid than that of the Mississippi, they have long been contemplated, particularly the Tombigbee, as affording a better communication to the ascending or returning trade from New Orleans to the waters of the Tennessee, from which they are separated by short portages.

COMMUNICATIONS BETWEEN THE ATLANTIC RIVERS,

AND THE

RIVER ST. LAURENCE AND GREAT LAKES.

VESSELS ascend the river St. Laurence from the sea to Montreal. The river Sorel discharges at some distance below that town the waters of lake George and lake Champlain, which penetrate southwardly within the United States. From Montreal to lake Ontario, the ascent of the river St. Laurence is estimated at about 200 feet. From the eastern extremity of lake Ontario, an inland navigation for vessels of more than 100 tons burthen, is continued more than one thousand miles, through lakes Erie, St. Clair, and Huron, to the western and southern extremities of lake Michigan, without any other interruption than that of the falls and rapids of Niagara, between lake Erie and lake Ontario. The descent from fort Schlosser to Devil's hole, a distance of four miles, which includes the perpendicular falls of Niagara, has by correct measurement been ascertained at 375 feet. The whole fall from lake Erie to lake Ontario, is estimated at 450 feet, making the elevation of lake Erie above tide water, six hundred and fifty feet.

Lake Superior, the largest of those inland seas, communicates with the northern extremity of lake Huron, by the river and rapids of St. Mary's. The fall of these is not ascertained: but it is said that a small canal has been opened around the most difficult part, by the North West Fur company.

Five of the Atlantic rivers approach the waters of the St. Laurence; viz. The Penobscot, Kennebeck, Connecticut, the North, or Hudson river, and the Tioga branch of the Susquehannah. This last river will afford a useful communication with the rivers Seneca, and Genessee, which empty into lake Ontario. The length of the portage has not been precisely stated; and the general navigation of the Susquehannah has already been noticed. It may however be observed, that it is the only Atlantic river whose sources approach both the western waters, and those of the St. Laurence.

The three eastern rivers, afford convenient communications with the province of Lower Canada, but not with that extensive inland navigation, which penetrates through the United States, within two hundred miles of the Mississippi. No statement has been received of any improvement having yet been made on the Penobscot, or Kennebeck; and a very imperfect account has been obtained of some short canals opened around the several falls of the river Connecticut. One at Bellows' falls, in the state of Vermont, has been particularly mentioned, and is the highest improvement on the river.

What is called the North river, is a narrow and long bay, which in its northwardly course from the harbor of New York, breaks through, or turns all the mountains, affording a tide navigation for vessels of 80 tons to Albany and Troy, 160 miles above New York. This peculiarity distinguishes the North river from all the other bays and rivers of the United States. The tide in no other ascends higher than the granite ridge, or comes within thirty miles of the Blue Ridge, or eastern chain of mountains,

In the North river, it breaks through the Blue Ridge at West Point, and ascends above the eastern termination of the Catskill, or great western chain.

A few miles above Troy, and the head of the tide, the Hudson from the north, and the Mohawk from the west, unite their waters, and form the North river. The Hudson in its course upwards, approaches the waters of lake Champlain, and the Mohawk, those of lake Ontario.

I. HUDSON AND CHAMPLAIN, OR NORTHERN NAVIGATION.

A COMPANY was incorporated several years ago by the state of New York, for the purpose of opening this communication, and a survey taken by Mr. Weston, a copy of which has not yet been obtained. From collateral information, it appears that it was proposed to open a canal 12 miles long, with a lockage of 106 feet, from Waterford, at the confluence of the Hudson and Mohawk, to the upper end of the great falls of Stillwater. This was considered as the most difficult part of the whole route, and the expense estimated at 275,000 dollars. Another canal and lock would be necessary around the falls of fort Miller: but the remainder of the navigation up the Hudson to fort Edward, does not require any material improvement.

At some distance above fort Edward, it was intended to connect by a canal and locks, the Hudson with the *North Wood* creek, at fort Ann. The navigation down the creek to Skeensborough is used, but requires to be improved. At this place, where falls render another canal necessary, North Wood creek empties into the south bay of lake Champlain; and thence is a natural sloop navigation through the whole extent of the lake. The expense of the works from fort Edward to Skeensborough, had been estimated at 200,000 dollars.

The funds of the company were insufficient, and

have, it is said, been expended without much permanent utility at Stillwater and Skeensborough.

The distance in a straight line from Waterford to Skeensborough is fifty miles; and the expense of opening a permanent boat navigation on a proper plan through the whole line, is from imperfect materials estimated at about 800,000 dollars. This communication would divert to a port of the United States the trade of one half of the state of Vermont, and of a part of that of New York, which is now principally carried through the channel of the St. Lawrence, and of the province of Canada.

II. MOHAWK AND ONTARIO, OR WESTERN NAVIGATION.

A COMPANY incorporated by the state of New York, for the improvement of this navigation, has made considerable progress, and an accurate survey having been taken of the distances and levels of the greater part of the route, the result will in the first place be stated.

	DIST. <i>Miles.</i>	FALL. <i>Feet.</i>
From the tide water at Troy to Lansing mills on the Mohawk, is found the greatest impediment to the navigation of that river, consisting of the Cohos falls, which are 70 feet perpendicular, and of a succession of other falls, which continue to the north river,	4 2-3	140

From Lansing mills up the Mohawk to Schenectady, the height of the river at the time when the survey was taken, prevented Mr. Weston from correctly ascertaining the levels. The fall for that distance is therefore estimated at	12 1-3	28 1-4
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Carried forward,

17	168 1-4
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	DIST. Miles.	FALL. Feet.
<i>Brought forward,</i>	17	168 1-4
From Schenectady to the Little falls, - - - - -	57 1-2	110 1-2
The Little falls, which before the improvements made by the company, interrupted altogether the navigation, - - - - -	3-4	42
From the little falls to fort Stanwix, now Rome, - - - - -	48	59 1-2
This is the head of the navigation, and the summit level between it and West Wood creek, a branch of Lake Ontario, is 9 feet 3-4 above that part of the river Mohawk, where the navigation ceases, - - - - -	1 3-4	9 3-4
	<hr/> 125	<hr/> 390

The whole course of the Mohawk is therefore 125 miles in length, and the fall through that distance from the summit level to tide water is 390 feet.

At the distance of one mile and three quarters is Wood creek, the bed of which is used to its entrance into lake Oneida, the distance along its meanders being 23 miles, but in the line in which a canal might be cut, only 14 miles, and the fall 60 feet,

The Oneida forms a natural canal of twenty miles in length, and communicates by the Onondago

<i>Carried forward,</i>	<hr/> 34	<hr/> 60
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	DIST.	FALL.
	Miles.	Feet.
<i>Brought forward,</i>	34	60

and Oswego rivers with lake Ontario. The distance by water down those two rivers to Oswego, on lake Ontario, is 63 miles. The upper part of the navigation is generally good, but the last 12 miles from the Oswego falls, which are not passable, to lake Ontario, are a continued rapid. The fall from lake Oneida to lake Ontario has not been ascertained by actual measurement, but is estimated at 130 feet. From Rotterdam, on lake Oneida, to the mouth of Salmon creek on lake Ontario, a few miles east of Oswego, the distance is 22 miles; and the ground being favorable, it is expected that the line of canal would not exceed 26 miles,

26	130
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60	190
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The elevation of the summit level between the Mohawk and the waters of lake Ontario, being only 390 feet above the tide water at Troy, and 190 feet above lake Ontario, a canal navigation is practicable the whole distance. Whether this should be attempted for a sloop or boat navigation, must depend principally, if not altogether, on the supply of water. It is stated that the canal from the summit level to Troy, must necessarily follow the valley of the Mohawk, and perhaps occasionally enter and cross the river. Calculated for a boat navigation, the expense may be estimated as followeth:

Dollars.

Mr. Weston estimated the expense of a canal, from Lansing mills to tide water at Troy, around the Cohoes falls, at 250,000

The distance from the summit level to Lansing mill is 120 miles, and to lake Ontario, deducting the 20 miles occupied by lake Oneida, 40 miles, together 160 miles of canal, the digging of which at 8000 dollars a mile, is - - - \$ 1,280,000

The fall from the summit level to Lansing mills is 250 feet, and to lake Ontario 190 feet, together 440 feet lockage, which will require 55 locks of eight feet lift each. These at 7,500 dollars, the cost of the stone locks erected by the company at the Little falls, will cost about - - - - - 420,000

Feeder and aqueducts may be estimated at - - - - - 250,000

Making altogether two millions two hundred thousand dollars. - - - 2,200,000

It is not believed that a sloop navigation, if practicable, could be effected for a less sum than five millions of dollars. The following works have already been completed by the company :

At the Little falls a canal three quarters of a mile in length, has been opened, and a descent of 42 feet effected by six locks of solid masonry, each of which is 70 feet long, and 12 feet wide. At the German flats, four miles above the Little falls, another canal one mile in length, with two stone locks of the same materials and dimensions, effects a descent of ten feet.

On the summit level a canal one mile and three quarters in length, and supplied with water from the river Mohawk by a short feeder, unites that river

and Wood creek, by means of two locks of the same dimensions and materials, one at each extremity of the canal. All those canals are 2 feet and a half deep, 24 wide at bottom, and 32 at top, and admit boats of ten tons. It is proper to state, that at first, wooden locks had been erected at the Little falls, and brick locks on the summit canal. At both places they had become totally unfit for service at the end of seven years, and it was necessary to replace them by stone locks: a circumstance which encreased considerably the expense of the undertaking.

Several minor improvements have been made on the Mohawk; and the navigation of Wood creek, of which the principal defect is want of water, has been improved by raising dams, and by the erection of four temporary wooden locks. But until a canal shall have been opened the whole distance from the summit level to lake Oneida, the navigation will be imperfect, and the profits inconsiderable.

The funds of the company do not enable them to undertake the necessary improvements at the two extremities of the line, a canal around the Cohoes falls to tide water, and another canal from lake Oneida to lake Ontario. The usual portage at the first place is from Schenectady to Albany; and a very good and expensive artificial road of 16 miles, made by another company, unites the two towns. Another company has lately been incorporated, for the purpose of making an artificial road at the other extremity of the line from Rotterdam, on lake Oneida, to Salmon creek on lake Ontario.

The capital of the company is 232,000 dollars, of which the state of New York owns 92,000; but with the exception of one dividend of 3 per cent. all the tolls have been applied to the works; and including these and a debt of 20,000 dollars due by the company, the whole expenditure amounts to 370,000 dollars. The annual tolls do not yet exceed 13,000 dollars.

III. NIAGARA.

THE fall from lake Erie to lake Ontario has already been stated at 450 feet. A company had also been incorporated by the state of New York, for the purpose of opening a canal at this place: but it does not appear that any thing ever was attempted after the survey had been made. The intention seems to have been to open a canal navigation for boats only, from fort Schlosser to Devil's hole; the lake itself and Giles's creek would have supplied the water, and the expense was estimated at 437,000 dollars.

It is however evident that the canal, in order to be as eminently useful as the nature of the undertaking seems to require, should be on such scale as to admit vessels which can navigate both lakes. Considering the distance, which in that case must be extended to about ten miles, and the lockage of 450 feet, it is not believed that the expense can be estimated at less than 1,000,000 dollars.

THE works necessary to effect water communications between the tide water of the North river, the St. Laurence, and all the lakes, (lake Superior only excepted) are therefore estimated at four millions of dollars, viz.

	<i>Dollars.</i>
Northern navigation to lake Champlain, - - - - -	800,000
Western navigation to lake Ontario, - - - - -	2,200,000
Falls of Niagara for a sloop navigation, - - - - -	1,000,000
	<hr/>
	4,000,000
	<hr/>

The papers relative to those communications will be found under the letter (B.); but the utility of these will not be confined to the extensive navigation of the lakes themselves. For the mountains being completely turned, when arrived into lake Erie, the ridge

which separates the waters emptying into that and into lake Michigan, from the northern branches of the Ohio, and from the waters of the Mississippi, is of a moderate elevation, and is gradually depressed in its course westwardly. There is no doubt of the practicability of opening canals at a future period, between several of those waters, either by selecting proper levels, or by means of short tunnels across favorable parts of the ridge. It will at present be sufficient to point out the principal communications now in use.

The distance from lake Erie to lake Chetoughe, an extensive and important elevated reservoir, which is the source of the Canowango branch of the Allegheny, is seven miles by a continual ascent, the elevation of which is not ascertained.

From Presqu' isle on lake Erie, to Le Beuf on French creek, another branch of the Allegheny, the distance is sixteen miles, and a company is incorporated by the state of Pennsylvania, for making an artificial road across that portage.

The navigation from lake Chetoughe, and from Le Beuf to Pittsburgh, offers no impediment whenever the waters are high; and the greater part of the salt now consumed in the north-west counties of Pennsylvania, as far as Pittsburgh, and some distance down the Ohio, is brought from the salt springs of New York, by Oswego, through lake Ontario; then across the portage of Niagara to lake Erie, and thence by either of the two last mentioned portages to the waters of the river Allegheny.

The distance from the place where the Cayuga, a river emptying into lake Erie, ceases to be navigable, to the navigable waters of the Muskingum, which empties into the Ohio 170 miles below Pittsburgh, is only six miles; and a company is said to be formed for the improvement of that communication.

Sandusky river and the Scioto take their sources in the same swamp. The navigation of the Miami of lake Erie is interrupted by some falls; but its up-

per branches approach those of the Miami of the Ohio, and of the Wabash, and are stated as being nearly on the same level.

The Illinois river, which empties into the Mississippi above St. Louis, rises in a swamp, which when the waters are high, affords a natural canoe navigation to the sources of Chicago creek, a short stream, which falls into lake Michigan, at its southern extremity.

Another communication generally used by the Indian traders is that from Green bay, also in lake Michigan, to the Mississippi, by Fox river, and the Ouisconsing. Nor is there any doubt that if the inland navigation between the North river and the lakes was completely opened, the whole Indian trade either of the Mississippi by lake Michigan, or of the north-west by lake Superior, must necessarily center in an Atlantic port of the United States; a consideration of minor importance as a commercial object, when compared with the other advantages of that great communication, but of great weight in its relation to the political intercourse of the United States, with the Indians.

INTERIOR CANALS.

UNDER this denomination will be included all the canals of which any knowledge has been obtained, and which are not immediately on the rivers opening communications with the western waters or with those of the St. Laurence, although some of them may be considered as extending those communications to more remote sea ports. The documents from which the information is extracted will be found under the letters (C. c.)

I. MERRIMACK.

THE navigation of that river, which rising in the state of New-Hampshire, falls into the sea at Newburyport after a course of 180 miles, is interrupted by several falls. A canal called Blodget's canal has been opened around Asmoskeag falls. Lower down and about 40 miles from the sea, the Essex canal, 4 miles in length, and admitting boats drawing 3 feet and a half, will open a communication around the Patucket falls, effecting through 3 locks, a descent of 34 feet. From the lower extremity of the canal, the river is navigable to the head of the tide at Haverhill, although the fall be 45 feet within that distance. No particular account has been received of the capital expended; but it is believed that the work will be profitable to the undertakers.

The Middlesex canal, uniting the waters of that river with the harbor of Boston, is however the greatest work of the kind which has been completed in the United States.

That canal, 12 feet wide and 3 1-2 feet deep, draws its supply of water from Sudbury or Concord river, a branch of the Merrimack, and from the summit ground extends six miles with a descent of 28 feet to the Merrimack above the Patucket falls, and 22 miles with a descent of 107 feet to the tide water of the harbour of Boston. The descent to the Merrimack is effected by three, and that to tide water, by nineteen locks. They are all 90 feet long, 12 feet wide, of solid masonry and excellent workmanship.

In order to open that canal, it was necessary to dig in some places at the depth of 20 feet, to cut through ledges of rocks, to fill some vallies and morasses, and to throw several aqueducts across the intervening rivers. One of these across the river Shawshine is 280 feet long, and 22 feet above the

river. All those obstacles have been overcome, and boats of 24 tons, 75 feet long and 11 feet wide, can navigate the canal. Those in most general use are of smaller dimensions, and are drawn by two horses at the rate of three miles an hour. A raft of one mile in length and containing eight hundred tons of timber, has been drawn by two oxen, part of the way at the rate of one mile an hour. Common boats pass from one end of the canal to the other in 12 hours. The capital expended on the work is stated at 478,000 dollars, and the water rights and necessary land cost a further sum of 58,000 dollars. The total expense has exceeded 550,000 dollars: the tolls have never yet exceeded 17,000 dollars a year, but are encreasing.

Several other canals have been contemplated in the state of Massachusetts, intended to unite the waters of Providence or Patucket river, with those of Charles river, which falls into the harbor of Boston, and of the river Connecticut. The grounds have been surveyed, but no particular description has been obtained, and the works have not yet been commenced.

II. SCHUYLKILL AND DELAWARE.

A COMPANY was incorporated several years ago by the state of Pennsylvania, for opening a canal from Norristown, on the river Schuylkill, to the tide water of the Delaware at Philadelphia. The distance is 16 miles, the fall 53 feet, and the canal deriving its water from the Schuylkill, would have been carried on a level to Philadelphia, and in its descent to the Delaware supplied the city with water, and the shipping with docks. The expense had been estimated at 533,000 dollars; the work was commenced, one third part of the digging effected, and a considerable sum expended. But either from want of funds, or from an improper selection of the ground, or from other causes not fully understood, the undertaking

if not altogether abandoned, has been suspended for several years.

This canal was intended as the first link of an extensive western communication. The Schuylkill, from Norristown to Reading, 46 miles higher up the river, being navigable a great portion of the year, was considered as the next link.

III. SCHUYLKILL AND SUSQUEHANNAH.

ANOTHER company was incorporated, for the purpose of opening an inland navigation between Reading, on the Schuylkill, to Middletown, on the Susquehannah. Both towns are in the great Lime stone valley, beyond the Blue Ridge, and the distance is 70 miles. It had been at first supposed that it would be sufficient to cut a canal four miles in length, on the summit level between the two rivers; and thereby to unite the Tulpehocken which falls into the Schuylkill, with the Quitipahilla, a branch of the Swatara, which empties into the Susquehannah. But it was soon ascertained that the original plan of improving by a succession of dams the navigation of those small rivers was erroneous, and that it would be necessary to cut a canal the whole way.

The summit level is at an elevation of 310 feet above the Schuylkill, and of 308 feet above the Susquehannah. Adjacent springs are considered sufficient for the upper locks: and the creeks would after a short descent afford an abundant supply. The proposed dimensions of the canal were a breadth of 20 feet at the bottom, and a depth of 3 feet and a half: and the expense was estimated at near 1,500,000 dollars.

The work was commenced: the canal has been cut the whole distance of 4 miles on the summit level; five locks made of brick have been constructed; land and water rights have been purchased, and a considerable capital has been expended. But although the state of Pennsylvania has permitted the company

to raise 266,000 dollars by lottery, and is bound to pay to them 300,000 dollars whenever the work shall have been completed, it remains suspended for want of funds.

The great lockage necessary for this canal, is the principal objection to that line of communication: and it has been suggested that a canal from Columbia, on the Susquehannah, to tide water or to the great Delaware and Chesapeake canal, would be much less expensive, and equally beneficial both to the interior country and to Philadelphia. This question, as many others suggested in this report, cannot be decided by any but practical and skilful engineers.

IV. APPOMATTOX.

A COMPANY has been incorporated for opening a canal from the upper end of the falls of that river, which is the south branch of James River, to Petersburg on the head of the tide. The distance is five miles, and the descent more than thirty feet to a bason, about 60 feet above the tide, in which the canal will terminate. The water is drawn from the river; and the canal 16 feet wide, 3 feet deep, and admitting boats of 6 tons, is nearly completed. The capital already expended amounts to sixty thousand dollars. But the company own thirty negroes, and suppose that their labor, and a further sum of ten thousand dollars, will be sufficient to build the locks, and to dig about half a mile which remains to be cut in order to open the communication between the river and the bason. This work which has been carried on with much zeal, and at a small expense, will open an important navigation of near 100 miles.

V. NEUSE AND BEAUFORT.

THE harbor of Beaufort, in North Carolina, and which must not be confounded with that of the same name in South Carolina, admits vessels draw-

ing eighteen feet of water. Ocracoke inlet the only navigable entrance into the Pamlico and Albemarle sounds, that extensive estuary of the rivers Chowan, Roanoke, Tar and Neuse, has less water, and is 70 miles from Newbern, on the last mentioned river. The distance between Newport, or Beaufort river and the Neuse, being only three miles, and the elevation of the highest intervening ground no more than seven feet above tide water, a canal uniting the two rivers, was undertaken by a company incorporated for that purpose by the state of North Carolina. All the shares have, from particular circumstances, become the property of one individual; and the work which had been commenced some years ago, is now suspended.

VI. CAPE FEAR RIVER.

A COMPANY incorporated by the same state, for improving the navigation of this river, after having exhausted a portion of their funds, which did not exceed twelve thousand dollars, in fruitless attempts to improve the natural navigation of the river, have opened a canal with a lock, which opens a safe passage around the Buck horn or great falls, seven miles below the junction of the Deep and Haw river. Another canal, six miles in length, with two locks, is necessary around Smilie's falls. Nearly half that distance has been completed; but the work is now suspended for want of funds. The legislature has lately authorised the company to encrease their capital.

VII. NEW ORLEANS.

THE canal Carondelet, which has already been mentioned, extends from Bayou St. John, to the fortifications or ditch of the city, and thereby opens an inland communication with lake Pontchartrain. A company is incorporated by the territorial legislature,

for the purpose of repairing and improving that work, and of uniting the canal by locks with the Mississippi. Independent of other advantages, this undertaking would enable government to transport with facility and use the same naval force for the defence of both the Mississippi and lake Pontchartrain, the two great avenues by which New Orleans may be approached from the sea.

TURNPIKE, OR ARTIFICIAL ROADS.

A great number of artificial roads have been completed in the eastern and middle states, at an expense varying from less than one thousand to fourteen thousand dollars a mile. The labor bestowed on the least expensive species consists in shortening the distance, diminishing the ascent of hills, removing rocks, levelling, raising and giving a proper shape to the bed of the roads, draining them by ditches, and erecting bridges over the intervening streams. But the natural soil of the road is used, instead of covering it with a stratum of gravel or pounded stones.

It appears by one of the papers marked (D.) under which letter will be found all the information which has been obtained respecting roads, that fifty turnpike companies have been incorporated, since the year 1803, in the state of Connecticut alone; and that the roads undertaken by those companies are all of that description. Thirty nine of those roads extending together 770 miles, are completed. The most expensive is that from New Haven to Hartford, which has cost 79,261 dollars; or the distance being 34 miles and three quarters, at the rate of 2,280 dollars a mile: but about 18,000 dollars of the capital have been expended in the purchase of the land through which the road is carried. The nett income on this road, deducting the annual repairs and expenses from the annual tolls, does not exceed 3000 dol-

lars. Of six of the roads, which together extend 120 miles, no account has been received. The other thirty two extend together 615 miles, and have cost only 340,000 dollars, or on an average at the rate of 550 dollars a mile : and it seems that the aggregate of annual tolls on the whole is 86,000 dollars ; from which deducting the annual repairs and expenses, amounting to 48,000 dollars, leaves a nett income of 38,000 dollars, or of about eleven per cent. on the capital expended.

No particular account has been received of the roads in the other eastern states ; but it is known that besides some of a similar description with those of the state of Connecticut, several of a more expensive kind have been completed, particularly in Massachusetts. The cost has varied from 3000 to 14,000 dollars a mile ; and amongst artificial roads of the first grade may be mentioned those from Boston to Providence, to Salem, and to Newburyport. These are all covered with an artificial stratum of gravel or pounded stones, and finished in the most substantial manner. Great expense has also been incurred in order to shorten the distance without exceeding the angle of ascent, which is fixed at 5 degrees ; and it is stated that the road to Newburyport, 32 miles in length, and in which marshes and rocks presented considerable obstacles, has cost 400,000 dollars, or at the rate of 12,500 dollars a mile. Those expensive roads, however useful and permanent, appear to be much less profitable than those of Connecticut. The Salem road is said to yield six per cent. another road has been stated as yielding eight per cent. the income of all the others in the state of Massachusetts, is said not to exceed on an average three per cent. and that of the road from Boston to Newburyport, amounts to no more than two per cent.

A greater capital has been vested on turnpike roads in the state of New York, than in any other. In less than seven years, sixty seven companies have been incorporated, with a nominal capital of near five

millions of dollars, for the purpose of making more than 3000 miles of artificial roads; and twenty one other companies have also been incorporated with a capital of 400,000 dollars; for the purpose of erecting 21 toll bridges. Although no particular account has been received either of the capital actually expended, of the annual amount of tolls, or of the materials of the roads, it is known that great progress has been made: and it has been stated that nine hundred miles of road were already completed by 23 companies, whose capital amounted to 1,800,000 dollars, and who had 200 miles of road more to finish.

Those roads extend in every direction, but particularly from every town or village on the North river, westwardly and north-westwardly, towards the waters of the Susquehannah, and those of the great lakes. The most expensive is that from Albany to Schenectady, fourteen miles long, and which has cost at the rate of ten thousand dollars a mile. Near 140 miles of roads extending westwardly from Albany and Schenectady, appear to have cost at the rate of 2,500 or 3,000 dollars a mile. The expense of all the others does not seem on an average to exceed 1,250 dollars a mile.

More detailed information has been obtained respecting the roads in New Jersey, Pennsylvania and Maryland.

In New Jersey a turnpike road has lately been completed from Trenton to Brunswick. The distance is 25 miles; the greatest angle of ascent 3 degrees, and the road is nearly in a straight line, the only considerable obstruction being the "Sand Hills," through which it was necessary to dig at the depth of thirty feet, in order not to exceed the angle of ascent. The road is 36 feet wide, fifteen feet of which are covered with about 6 inches of gravel. A few wooden bridges with stone abutments and piers have been erected across the intervening streams. The whole expense is stated at 2,500 dollars a mile. From Brunswick the road will be extended to Eliza,

both town, and the work is now progressing. Another road has been undertaken in the same state from Brunswick to Easton, on the river Delaware. The distance is 43 miles, of which eleven have been completed at an expense of 40,000 dollars. This road will be more expensive than the preceding, both on account of the ground; the bridges being more numerous, and the Blue Ridge, (Muscone-kong mountain) intervening: and because a more substantial facing or greater thickness of gravel is requisite. The funds of the company are exhausted.

In Pennsylvania artificial roads of the most substantial kind, have been completed, or are progressing, from Philadelphia, in sundry directions.

The principal are to Bristol and Trenton, 12 miles of which are completed; to Germantown and Perkiomen, with two branches to Willow Grove, and to Chesnut Hill; and to Lancaster and Columbia, with a branch to Harrisburgh.

The distance from Philadelphia to Perkiomen is 25 miles and a quarter; the two branches extend, one 10 miles and the other 7 miles and a half; making together, near 43 miles. The angle of ascent is 4 degrees; the breadth of the road fifty feet, of which 28 feet, having a convexity of 15 inches, are covered with a stratum either of gravel 18 inches thick or of pounded stones 12 inches thick. One half of the stones forming the lower part of the stratum, are broken into pieces not more than five inches in diameter: the other half or upper part of the stratum consists of stones broken into pieces not more than two inches and a half in diameter: and this difference in the size of the stones is represented as a considerable defect. Side or summer roads extend on each side of the gravel or stone road. The five miles next to Philadelphia have cost at the rate of 14,517 dollars a mile. The other 20 miles and a half at the rate of 10,490 dollars a mile. Yet there were no natural impediments, and only small bridges or culverts were necessary. The capital expended on these

25 miles and a half is 285,000 dolls.: the tolls amount to 19,000 dollars: the annual repairs and expenses to 10,000 dollars: the nett income to about 9,000 dollars, or little more than 3 per cent. on the capital expended.

The distance from the Schuylkill, at Philadelphia, to Lancaster, is 62 miles and a quarter. Exclusively of the side or summer roads, twenty four feet of the bed of the road are covered with a stratum of pounded stones 18 inches thick in the middle of the road, and decreasing each way to 12 inches. The Valley hills are the most elevated and steep on the road; but the angle of ascent no where exceeds 4 degrees. Stone bridges have been erected across all the intervening streams. That across the river Conestogo consisting of nine arches, is private property; and the most expensive built by the company, is that across the Brandywine, consisting of three arches of solid masonry, and which cost 12,000 dollars. The capital of the company amounted to 360,000 dollars; but this being insufficient, it became necessary to apply a considerable portion of the tolls to the completion of the work. The whole expense amounts to 465,000 dollars, or at the rate of about 7,500 dollars a mile. The annual tolls have not yet exceeded 25,000 dollars; and the annual repairs and expenses are estimated at 13,000, leaving a nett income of about 12,000 dollars. The prospect of an increased profit, derived from the proposed extension of the road, has however raised the price of that stock nearly to par.

The Lancaster road, the first extensive turnpike that was completed in the United States, is the first link of the great western communication from Philadelphia. It has been extended ten miles westwardly to Columbia on the Susquehannah, and another branch is now progressing northwestwardly to Harrisburgh, also on the Susquehannah, and 36 miles from Lancaster. The state of Pennsylvania has also incorporated two companies in order to extend the road by two different routes as far as Pittsburgh on the Ohio, and near 300 miles from Philadelphia.

The southern route, following the main post road, passes by Bedford and Somerset. The northern route passes by Huntingdon and Frankstown, the highest point to which the Juniata branch of the Susquehannah is navigable. To this route the state has authorised a subscription of one hundred thousand dollars.

Other roads in a north-west direction from Philadelphia, towards the Genessee and Presqu'isle on lake Erie, are also progressing, and have been encouraged by the subscriptions or donations of the legislature. They are generally on a much less expensive plan than those in the direction of Pittsburgh. A section of 30 miles from Lausanne on the Lehigh, to Nescopeck on the Susquehannah, has been completed at the expense of 36,000 dollars, by a company; and it is intended to extend it 70 miles further to Newton, on the Tioga branch of the Susquehannah.

In Maryland, roads extending from Baltimore in various directions, have lately been undertaken by several companies and are rapidly progressing. On the falls turnpike, which extends in a northerly direction, about four miles of a road 22 feet wide, covered with a stratum of pounded stones 10 inches thick, and having an ascent not exceeding 4 degrees, have been completed at the rate of 7,500 dollars a mile.

The "Reister town" turnpike, in a north-westwardly direction, extends 16 miles to that village; whence two branches extending one 19 and the other 29 miles farther, will enter Pennsylvania at two different places. The road 24 feet wide, is covered with a stratum 12 inches thick, of pounded stones not more than 3 inches in diameter. The angle of ascent does not exceed 3 degrees and a half. Ten miles have been completed at the expense of 10,000 dollars a mile, and the work is progressing. The capital of the company amounts to 420,000 dollars.

The capital of the "Frederick town" turnpike company amounts to 500,000 dollars; and the company is authorised to open the great western road, as

far as Boonsborough, beyond the Blue Ridge, and 62 miles from Baltimore. The angle of ascent will not exceed 4 degrees; the road has a convexity of 9 inches, and on a breadth of 22 feet is covered with a stratum 10 inches thick of pounded stones, not exceeding 3 inches in diameter, over which are spread two inches of gravel or coarse sand. The first 20 miles next to Baltimore have cost at the rate of 9,000 dollars, and the next 17 miles are contracted for at the rate of 7,000 dollars a mile.

The distance from Boonsborough to Cumberland, at the foot of the Allegheny mountain, following the present road is 73 miles, and although the company is not yet authorised to extend the turnpike to that place, the ground has been surveyed, and it is ascertained that the road may be continued with an angle of ascent not exceeding 4 degrees. The ascent of the road laid out by the United States from Cumberland to Brownsville, on the Monongahela, does not exceed 5 degrees, and the distance is 72 miles: making the whole distance of a turnpike road from Baltimore to the navigable waters of the Ohio, 207 miles. The distance from the City of Washington to the same spot on the Monongahela is some miles shorter, being as has already been stated, the shortest communication between tide water and the navigable western waters.

South of the Potomac few artificial roads have been undertaken. From Alexandria one is now progressing in a northwestwardly direction towards Middleburgh. Another has lately been commenced from Richmond to Ross's coal mine. But the only one which, so far as any accounts have been received, is completed, extends 12 miles from Manchester, opposite to Richmond, in a westwardly direction to the coal mines of Falling creek. This road, 36 feet wide is gravelled and has cost 50,000 dollars: but the last 4 miles did not cost more than at the rate of 3000 dollars a mile. Yet it is sufficiently substantial, the

route being very level, to admit waggons carrying four tons.

The greater progress made in the improvement of roads in the northern parts of the union, must be principally ascribed to a more compact population, which renders those improvements more necessary, and at the same time supplies with greater facility the means of effecting them. The same difference is perceptible in the number of bridges erected in the several states.

In the eastern states, and particularly Massachusetts, wooden bridges uniting boldness to elegance, and having no defect but want of durability, have been erected over the broadest and deepest rivers. In the lower counties of Pennsylvania stone bridges are generally found across all the small streams. Both in that state, and at some distance eastwardly, bridges with stone piers and abutments, and a wooden superstructure are common over wide rivers. Of these the most expensive, and which may be considered as the first in the United States, is the permanent Schuylkill bridge near Philadelphia, erected by a company at an expense of 300,000 dollars. Its length including the abutments does not exceed 750 feet, and it is supported only by two piers and the abutments. But those piers, 195 feet apart, are of the most solid workmanship, and one of them was sunk at a depth of more than 24 feet below low water. The bridge is 42 feet wide, and the wooden superstructure is enclosed and covered with a shingle roof.

The want of bridges south of Pennsylvania, even on the main post road, is sensibly felt. One lately thrown across the Potomac 3 miles above the city of Washington, and which without any intervening piers is wholly suspended to iron chains extending from bank to bank, deserves notice on account of the boldness of its construction, and of its comparative cheapness. The principle of this new plan, derived from the tenacity of iron, seems applicable to all rapid streams of a moderate breadth.

The general principles of improved roads seem to be: 1st, the reduction of hills by diminishing the angle of ascent, which ought not to exceed, whenever practicable, 3 degrees and a half, and under no circumstances five degrees: 2d, a sufficient convexity in the bed of the road, together with ditches and drains, all which are intended to prevent the injury caused by standing water or freshets: 3d, an artificial bed of pounded stones or gravel sufficiently substantial to support the weight of the carriages in general use on the road, either for the conveyance of persons, or for the transportation of merchandize.

On the last point it appears from the facts already stated, or scattered in the communications received on that subject: 1st, That the stones ought to be similar in quality and reduced to the same size, which should not exceed three inches in diameter: 2d, That the preferable qualities of stone, rank in the following order—hard black stone, granite, flint, or quartz, blue lime stone, white ditto: 3d, That the stratum may be either of pounded stones 12 inches thick, or of pounded stones 10 inches thick, with 2 inches of gravel spread over the stones; or entirely of gravel 18 inches thick: 4th, That when the materials are equally convenient, the expense of those three modes will not materially differ, but that the rate of expense depends principally on the number of hills and bridges, distance of materials, breadth of the road, and price of labor: and 5th, That the general adoption of broad wheels for the transportation of heavy loads, is necessary to the full enjoyment of the advantages expected from the most substantial artificial roads. On the degree of convexity and on the proper shape to be given to the natural bed of the road under the artificial stratum, a diversity of opinions seems to prevail.

The roads heretofore made may be divided into three general classes.

1. Those where the only improvement consists in the reduction of hills, and in the convexity and

ditches of the road, whereby the angle of ascent is rendered more easy, and standing water excluded; but where the natural soil is used without any artificial stratum. The expense of these roads may vary according to local circumstances, and the perfection of the work, from five hundred to one thousand dollars a mile. They are most generally in use in the eastern states, and may be introduced with advantage in all those districts of country, where wealth does not admit more expensive improvements, or where the materials of an artificial stratum are altogether wanting. It is only in the last case, that they may be considered as a national object; and no other improvement besides bridges and causeways, is perhaps practicable in the lower country of the southern states. Iron, and even timber rail roads, may however be sometimes substituted in those level parts of the country, where stones and gravel are not to be found.

2. Roads prepared as above, of a reduced breadth, and covered with a thin coat of gravel not more than six or nine inches thick; such as the turnpike lately made between Trenton and Brunswick. These roads, the expense of which may be estimated at about 3000 dollars a mile, may be used wherever the frost does not materially affect them, and in every climate, when they are intended principally for the conveyance of persons, and not for the transportation of heavy loads.

3. The artificial roads of the best construction, such as have been already described. These when not exceeding 22 feet in breadth, and except in the vicinity of large cities, will cost at the rate of 7000 dollars a mile, exclusively of bridges over large rivers. And they must be resorted to, whenever a *commercial* road for heavy transportation is intended, particularly in the middle states, or rather in the United States, between 41 and 36 degrees of north latitude. North of the 41st degree, the snow lies generally during the whole winter; and the great bulk

of heavy transportation is effected in sleighs during that season. There is therefore less necessity for using the roads in the spring; and they are also better protected against the effects of the frost by the snow. South of the 36th degree, which in the Atlantic states may be considered as the boundary of the great cotton cultivation, the frost does not materially injure the roads. It is between those two extremes that the most substantial are required; and it also happens that the great land communications with the western country, which considerably increase the amount of transportation, are principally within the same limits.

The same principles, which have directed the arrangement adopted in this report in relation to canals, will also point out those roads which seem in the first instance to claim the patronage of the general government.

Those which appear most necessary for the communications between the Atlantic and western rivers have already been mentioned under that head; and the improvement of the water communication between the North river and the great lakes ought to take the precedence of any other in that direction.

That road which therefore seems exclusively to claim public attention, is a great turnpike extending from Maine to Georgia in the general direction of the sea coast and main post road, and passing through all the principal sea ports. The general convenience and importance of such a work are too obvious to require any comments: and the expense seems to be the primary object of consideration.

The distance will be roughly estimated at 1,600 miles; and from what has been stated on the subject of roads generally, it may be inferred that the greater part of the road being intended almost exclusively for travelling, and not for transportation of heavy articles, the expense cannot exceed the rate of 3,000 dollars a mile. For although some detached portions

of the route, being commercial roads, must be improved as such, and at a greater expense; an equivalent reduction in other parts will result from those portions which are already improved by private companies, and from the impossibility, for want of materials for an artificial stratum, of going in some places beyond what has been described as the first or cheapest species of turnpikes. The whole expense may therefore be estimated at 4,800,000 dollars.

A secondary object, but of more importance to government than to individuals, would be the improvement, on a much less expensive scale, of certain portions of roads leading to some points on the extremes of the union, intended principally for the purpose of accelerating the progress of the mail, and the prompt transmission of information of a public nature. The points contemplated, are Detroit, St. Louis in Upper Louisiana, and New Orleans. The portions of road which traversing a wilderness cannot be improved without the aid of the United States, are; from the Tuscarora branch of the Muskingum to Detroit; from Cincinnati, by Vincennes, to St. Louis; and from Nashville in Tennessee, or Athens in Georgia, to Natches. The expense necessary to enable the mail and even stages to proceed at the rate of 80 miles a day, may, at the rate of about 200 dollars a mile, including bridges over all the small streams, be estimated for those three roads, at 200,000 dollars.

RECAPITULATION AND RESOURCES.

THE improvements which have been respectfully suggested as most important, in order to facilitate the communication between the great geographical divisions of the United States, will now be recapitulated; and their expense compared with the resources applicable to that object.

I. From north to south, in a direction parallel to the sea coast :

Dollars.

- | | |
|---|-----------------|
| 1. Canals opening an inland navigation for sea vessels from Massachusetts to North Carolina, being more than two thirds of the Atlantic sea coast of the United States, and across all the principal capes, cape Fear excepted, | 3,000,000 |
| 2. A great turnpike road from Maine to Georgia, along the whole extent of the Atlantic sea coast, | 4,800,000 |
| | <hr/> 7,800,000 |

II. From east to west, forming communications across the mountains between the Atlantic and western rivers :

- | | |
|---|-----------------|
| 1. Improvement of the navigation of four great Atlantic rivers, including canals parallel to them, | 1,500,000 |
| 2. Four first rate turnpike roads from those rivers across the mountains, to the four corresponding western rivers, | 2,800,000 |
| 3. Canal around the falls of the Ohio, | 300,000 |
| 4. Improvement of roads to Detroit, St. Louis and New Orleans, | 200,000 |
| | <hr/> 4,800,000 |

III. In a northern and north westerly direction, forming inland navigations between the Atlantic sea coast, and the great lakes and the St. Laurence :

<i>Brought forward,</i>	-	12,600,000
1. Inland navigation between the North river and lake Champlain,	-	800,000
2. Great inland navigation opened the whole way by canals, from the North river to lake Ontario,	-	2,200,000
3. Canal around the falls and rapids of Niagara, opening a sloop navigation from lake Ontario to the upper lakes, as far as the extremities of lake Michigan,	-	1,000,000
		<hr/> 4,000,000
Making together,	-	<hr/> <u>\$ 16,600,000</u>

IV. The great geographical features of the country have been solely adhered to in pointing out those lines of communication : and these appear to embrace all the great interests of the union, and to be calculated to diffuse and encrease the national wealth in a very general way, by opening an intercourse between the remotest extremes of the United States. Yet it must necessarily result from an adherence to that principle, that those parts of the Atlantic states through which the great western and north west communications will be carried, must, in addition to the general advantages in which they will participate, receive from those communications greater local and immediate benefits, than the eastern, and perhaps southern states. As the expense must be defrayed from the general funds of the union, justice, and perhaps policy not less than justice, seem to require that a number of local improvements, sufficient to equalize the advantages, should also be undertaken in those states, parts of states, or districts, which are less immediately interested in those inland communications. Arithmetical precision cannot indeed be ob-

tained in objects of that kind ; nor would an appropriation of the monies applied, according to the population of each state, be either just or practicable ; since roads, and particularly canals, are often of greater utility to the states which they unite, than to those through which they pass. But a sufficient number of local improvements, consisting either of roads or canals, may without any material difficulty be selected so as to do substantial justice, and give general satisfaction. Without pretending to suggest what would be the additional sum necessary for that object, it will, for the sake of round numbers, be estimated at

Which added to the sum estimated		3,400,000
for general improvements,	-	16,600,000
		<hr/>
Would make an aggregate of twenty millions of dollars,	-	20,000,000
		<hr/>

An annual appropriation of two million of dollars, would accomplish all those great objects in ten years, and may without inconvenience, be supplied in time of peace, by the existing revenues and resources of the United States. This may be exemplified in several ways.

The annual appropriation on account of the principal and interest of the public debt, has, during the last six years, amounted to eight millions of dollars. After the present year, or at farthest, after the ensuing year, the sum which, on account of the irredeemable nature of the remaining debt, may be applied to that object, cannot in any one year exceed 4,600,000 dollars, leaving therefore from that source alone, an annual surplus of 3,400,000 dollars, applicable to any other object.

From the 1st January, 1801, to the 1st January, 1809, a period of eight years, the United States shall have discharged about 34 millions of the principal of the old debt, or deducting the Louisiana debt, incurred during the same period, and not yet discharg-

ed, about 23 millions of dollars. They may with equal facility, apply in a period of ten years, a sum of 20 millions of dollars, to internal improvements.

The annual permanent revenue of the United States, calculated on a state of general peace, and on the most moderate estimate, was in a report made to Congress on the 6th day of December, 1806, computed for the years 1809–1815, at 14 millions of dollars. The annual expenses on the peace establishment, and including the 4,600,000 dollars, on account of the debt, and 400,000 dollars for contingencies, do not exceed eight millions and a half, leaving an annual surplus of five millions and a half of dollars. To provide for the protection and defence of the country, is undoubtedly the object to which the resources of the United States, must, in the first instance be applied, and to the exclusion of all others, if the times shall require it. But it is believed, that in times of peace, (and to such period only are these remarks applicable) the surplus will be amply sufficient to defray the expenses of all the preparatory measures of a permanent nature which prudence may suggest, and to pay the sum destined for internal improvements. Three millions annually applied during the same period of ten years, would arm every man in the United States, fill the public arsenals and magazines, erect every battery and fortification which could be manned, and even, if thought eligible, build a navy. That the whole surplus would be inadequate to the support of any considerable increase of the land or naval force kept in actual service in time of peace, will be readily admitted. But such a system is not contemplated: if ever adopted, the objects of this report must probably be abandoned. For, it has not heretofore been found an easy task for any government to indulge in that species of expenses, which leaving no trace behind it, adds nothing to the real strength of the country, and at the same time to provide for either its permanent defence or improvement.

It must not be omitted that the facility of communications, constitutes, particularly in the United States, an important branch of national defence. Their extensive territory opposes a powerful obstacle to the progress of an enemy. But on the other hand, the number of regular forces, which may be raised, necessarily limited by the population, will for many years be inconsiderable when compared with that extent of territory. That defect cannot otherwise be supplied than by those great national improvements, which will afford the means of a rapid concentration of that regular force, and of a formidable body of militia, on any given point.

Amongst the resources of the union, there is one which from its nature seems more particularly applicable to internal improvements. Exclusively of Louisiana, the general government possesses, in trust for the people of the United States, about one hundred millions of acres fit for cultivation, north of the river Ohio, and near fifty millions south of the state of Tennessee. For the disposition of those lands a plan has been adopted, calculated to enable every industrious citizen to become a freeholder, to secure indisputable titles to the purchasers, to obtain a national revenue, and above all to suppress monopoly. Its success has surpassed that of every former attempt, and exceeded the expectations of its authors. But a higher price than had usually been paid for waste lands by the first inhabitants of the frontier became an unavoidable ingredient of a system intended for general benefit, and was necessary in order to prevent the public lands being engrossed by individuals possessing greater wealth, activity or local advantages. It is believed that nothing could be more gratifying to the purchasers, and to the inhabitants of the western states generally, or better calculated to remove popular objections, and to defeat insidious efforts, than the application of the proceeds of the sales to improvements conferring general advantages on the nation, and an immediate be-

nefit on the purchasers and inhabitants themselves. It may be added, that the United States, considered merely as owners of the soil, are also deeply interested in the opening of those communications, which must necessarily enhance the value of their property. Thus the opening of an inland navigation from tide water to the great lakes, would immediately give to the great body of lands bordering on those lakes, as great value as if they were situated at the distance of one hundred miles by land from the sea coast. And if the proceeds of the first ten millions of acres which may be sold, were applied to such improvements, the United States would be amply repaid in the sale of the other ninety millions.

The annual appropriation of two millions of dollars drawn from the general revenues of the union, which has been suggested, could operate to its full extent only in times of peace and under prosperous circumstances. The application of the proceeds of the sales of the public lands, might perhaps be made permanent until it had amounted to a certain sum, and until the most important improvements had been effected. The fund created by those improvements, the expense of which has been estimated at twenty millions of dollars, would afterwards become itself a perpetual resource for further improvements. Although some of those first communications should not become immediately productive, and although the same liberal policy, which dictated the measure, would consider them less as objects of revenue to government, than of increased wealth and general convenience to the nation, yet they would all sooner or later acquire, as productive property, their par value. Whenever that had taken place in relation to any of them, the stock might be sold to individuals or companies, and the proceeds applied to a new improvement. And by persevering in that plan, a succession of improvements would be effected until every portion of the United States should enjoy all the advantages of inland navigation and improved roads, of

which it was susceptible. To effect that great object, a disbursement of twenty millions of dollars, applied with more or less rapidity according to the circumstances of the United States, would be amply sufficient.

The manner in which the public monies may be applied to such objects, remains to be considered.

It is evident that the United States cannot under the constitution open any road or canal, without the consent of the state through which such road or canal must pass. In order therefore to remove every impediment to a national plan of internal improvements, an amendment to the constitution was suggested by the executive when the subject was recommended to the consideration of Congress. Until this be obtained, the assent of the states being necessary for each improvement, the modifications under which that assent may be given, will necessarily control the manner of applying the money. It may be however observed that in relation to the specific improvements which have been suggested, there is hardly any which is not either already authorised by the states respectively, or so immediately beneficial to them, as to render it highly probable that no material difficulty will be experienced in that respect.

The monies may be applied in two different manners: the United States may with the assent of the states, undertake some of the works at their sole expense; or they may subscribe a certain number of shares of the stock of companies incorporated for the purpose. Loans might also in some instances be made to such companies. The first mode would perhaps, by effectually controlling local interests, give the most proper general direction to the work. Its details would probably be executed on a more economical plan by private companies. Both modes may perhaps be blended together so as to obtain the advantages pertaining to each. But the modifications of which the plan is susceptible must vary according

to the nature of the work, and of the charters, and seem to belong to that class of details, which are not the immediate subject of consideration.

At present the only work undertaken by the United States at their sole expense, and to which the assent of the states has been obtained, is the road from Cumberland to Brownsville. An appropriation may for that purpose be made at any time. In relation to all other works, the U. States have nothing at this time in their power but to assist those already authorised; either by loans or by becoming stockholders; and the last mode appears the most eligible. The only companies incorporated for effecting some of the improvements considered in this report as of national and first rate importance, which have applied for such assistance, are the Chesapeake and Delaware canal, the Susquehannah canal, and the Dismal swamp companies; and authority might be given to subscribe a certain number of shares to each, on condition that the plan of the work to be executed should be approved by the general government. A subscription to the Ohio canal, to the Pittsburgh road, and perhaps to some other objects not fully ascertained, is also practicable at this time.

As an important basis of the general system, an immediate authority might also be given to take the surveys and levels of the routes of the most important roads and canals which are contemplated: a work always useful, and by which the practicability and expense of the undertakings would be ascertained with much more correctness than in this report. A moderate appropriation would be sufficient for those several objects.

In the selection of the objects submitted in obedience to the order of the Senate, as claiming in the first instance the aid of the general government, general principles have been adhered to, as best calculated to surpress every bias of partiality to particular objects. Yet some such bias, of which no indivi-

dual is perfectly free, may without being felt, have operated on this report. The national legislature alone, embracing every local interest, and superior to every local consideration, is competent to the selection of such national objects. The materials contained in the papers herewith transmitted, and the information to be derived from surveys taken under the authority of the general government, will furnish the facts necessary for a correct decision. Two communications, by Mr. B. H. Latrobe, and by Mr. Robert Fulton, marked E. and F. are in the meanwhile respectfully referred to, as containing much interesting practical information, connected with observations of a general nature, on the subject.

All which is respectfully submitted.

ALBERT GALLATIN,

Secretary of the Treasury.

TREASURY DEPARTMENT,

4th April, 1803.

Circular Queries,

By the Secretary of the Treasury, in order to obtain information.

NOTE. All the documents were obtained in answer to those queries.



QUERIES RESPECTING CANALS.

1. Points united by canal, and their distance by said canal.

2. Elevation of the highest ground through which canal passes; descent thence to the two extremities; and number of miles where canal is level.

3. Number, dimensions, contents, construction, and situation of locks.

4. Supply of water; whence obtained; its amount reduced to cubic feet per minute, hour or day; its elevation above the highest point of the canal; length of feeders; situation and contents of reservoirs. What additional resources may be resorted to if the present supply should fall short of the quantity wanted?

5. Designation of such parts of the route where the natural or improved bed of rivers is used.

6. Depth and breadth of canal; burthen of vessels; breadth of towing paths.

7. Aqueducts across valleys or rivers; tunnels through hills; bridges across the canal.

8. Particular obstructions and difficulties surmounted or to be encountered.

9. Defects either in the plan or execution, and the proposed remedies.

10. Estimate of the tonnage of vessels; species, weight and value of the articles annually conveyed by the canal; expense of carriage by canal, compared

with land or river carriage before canal was made; time employed in navigating through the whole canal.

11. Capital already expended, vested or wanted for completing the work.

12. Expenses per mile and in the whole, and as far as practicable, of every component part of the work in all its details.

13. Rate and gross amount of tolls ; annual expenses of repairs and contingencies ; annual nett income.

14. Substance of charters and acts of legislature on the subject.

QUERIES RESPECTING ARTIFICIAL ROADS.

1. Points united and their distance.

2. Elevation of the hills over which the road passes ; greatest angle of ascent which has been allowed.

3. Breadth, form, materials of the artificial road.

4. Bridges, their dimensions, materials, construction.

5. Particular obstructions and difficulties surmounted, or to be encountered.

6. Expenses per mile, and in the whole, and as far as practicable, of every component part of the work in all its details, viz. forming the bed of the road, cutting hills, quarrying, transporting, breaking, laying stones or gravel, &c.

7. Capital already expended, vested or wanted for completing the work.

8. Rate and gross amount of tolls ; annual expenses of repairs and contingencies ; annual nett income.

9. Substance of charters and acts of legislature on the subject.

Mr. Latrobe's Communication.

(E.)

Washington, March 16, 1808.

SIR,

I HAVE the honor of your letter of the 29th of July, 1807, transmitting to me a copy of the resolution of the Senate of the United States, of the 2d of March, 1807, together with a list of queries respecting artificial navigations, and canals, to which you request my answer and opinion.

In order to give you all the information on this subject which you wish, and I possess, and in the most condensed form, I ask your permission to depart from the order which your questions demand, and after treating the subject generally, to enter upon an account of those works, in detail, with which my personal experience has made me more particularly acquainted.

The most striking circumstance in a view of the Atlantic states of the union, in relation to the improvement of their internal navigation, is the uniformity of the natural arrangement of their rivers and mountains, and that this arrangement differs from that of ever other country in which artificial navigation has been attempted.

In other countries the general course of the rivers is between the mountains, and along the vallies; in this, the general course of the rivers is across that of the mountains and of the vallies. Our mountains, from their termination to the south-west in Georgia, hold a course to the east of north; the general direction of our principal rivers is to the east of south: and on inspection of the map, it will be observed, that as the direction of the mountains to the N. E. of the Delaware, becomes more easterly, so do our rivers acquire a more southern course,

always crossing the mountains at nearly the same angle.

Our rivers may be divided into three classes;—

Primary rivers, that discharge their water immediately into the ocean. Of these the relative magnitude might be rated, according to the surface they respectively drain; *Secondary rivers*, or such as fall into the first, above their tide water; and *Creeks*, properly so called, which rise below the falls of the first rivers, or rather collect the water of the level land below the falls, and discharge it into the tide waters.

Of our primary rivers, the Susquehannah is the principal. By a great degree of geographical injustice, this mighty river loses its name at the foot of its falls, and is called, the Chesapeake bay, from thence to the ocean; although its width compared with its length, forbids the term of bay to be applied to what is called the Chesapeake. All of these rivers cross in the greatest part of their course the direction of the mountains. Of the *secondary rivers*, many of which are of great importance and magnitude, some and perhaps the greatest number hold a course parallel to the mountains, as the Shenandoah, the Conogochegue, the Lehigh, &c. draining the vallies, and receiving away the torrents of the mountains.

The third order of our water courses rise either in the lowest ridge of our hills, which I will call the granite ridge, and over which all our principal rivers, from Georgia to the Hudson, fall, and then run through the alluvial country which lies between the granite ridge and the ocean. Such rivers are, the Nottoway, the Blackwater, the Meherrin, the Annacosta, (eastern branch of Potomac) the Elk river, and the very important creek in the state of Delaware, the Christiana; or they are merely drains of the alluvial country, assuming an appearance of importance below the head of the tide, above which they are mere torrents, almost dry in the autumn. Such streams are all the rivers of the eastern shore of the

Chesapeake, and of the lower part of the Jerseys, and innumerable water courses, forming large estuaries in the southern states.

Our great north western lakes, from their first source to the eastern end of lake Erie, may be considered as part of the great river St. Laurence, following the direction of the rest of our rivers, until opposed by the northern extremity of the Allegheny. From thence its course follows the valley west of the Allegheny, through lake Ontario to the ocean, receiving the waters of the northern extremity of the mountain in its course,

This general view of the construction of our country was necessary in order to understand the general principles on which our artificial navigation can be so conducted, as to be useful, or even practicable; and to explain why connections of waters, which on the map appear advantageous and feasible, would be useless, and perhaps impracticable, by any effort of art.

Two principal objects will dictate all the exertions towards the improvement of our internal navigation, which can for many years to come be attempted: 1. To carry our produce by water to the nearest port for its exportation, and the importation of foreign articles: 2. To exchange by internal commerce the articles reciprocally deficient on lines parallel to the sea coast. Canals, the use of which arises from manufacturing activity, will not probably be soon required.

The first object,—as all our principal rivers run seaward, and generally by the shortest course,—must be attained by the natural or improved navigation of the rivers themselves, or by canals cut parallel to them: the second may often require a navigation parallel to the vallies, so as to communicate one principal river with another.

The former attempt at improved navigation has already been made on many of our principal rivers,—the latter has been seldomer undertaken; and only

once above the falls of both primary rivers, in the canal intended to join the Susquehannah and Schuylkill, and the Schuylkill and Delaware rivers above Philadelphia.

The general construction of our country opposes to artificial navigation, in either of these directions, difficulties, which in no part of the world exist in so uniform, and certain a degree. Canals parallel to our rivers, have three formidable obstacles to encounter and overcome.

1. The rapid descent of the ravine cut through the mountains by the river itself, along which the canal must be carried ;—or, if the ravine be quitted, difficulties on the high levels, which, the further you go from the river, are always intersected by the more numerous ravines ; and embarrassed by the difficulty of returning to the ravine of the river.

2. The invariably rocky nature of the ground, which is uniformly of granite in all its varieties ; and has numerous fissures which carry off the water, and require lining.

3. The difficulty of keeping off the land water, and of crossing the lateral branches and torrents of the river.

On the other hand, canals parallel to our mountains must necessarily cross the ridge or spur of the mountain which divides the waters of two primary rivers. On this ridge above the falls, the water requisite to supply the canal, is always scanty, often there is none : and though a tunnel or a stream engine, or in the last resort a rail road, are certain means of obviating the difficulty, they are expensive, inconvenient and imperfect. Below the granite ridge, the difficulty is less. There may always be found a supply of water from the ridge itself ; and the feeders, though carried through rocky and expensive ground, are themselves useful as small canals, as far as they extend ; and below the ridge the soil is easily cut and embanked.

Having so frequently mentioned the granite ridge,

I will here trace its extent as far as my knowledge of our country enables me to do it.

The granite ridge forms the shore of the north side of Long island opposite to the island of New York. All the south of the island is alluvial, and is the first margin of alluvial soil below the granite ridge. This margin of alluvial soil beginning at Long island, widens as it extends to the south west, until in Georgia it becomes more than 200 miles in width.

Staten island and Bergen point, are two spurs of this same ridge, which continues nearly in the line of the post road to Trenton, where the river Delaware falls over it, having worn down the rocks more deeply there than many other of our rivers. The Delaware runs in its general direction for 60 miles under the ridge as far as New Castle, leaving it only for a short distance at particular bends of the river. At Philadelphia the ridge crosses the peninsula to Gray's ferry on Schuylkill. The softer granite of Schuylkill has been worn down so that the falls are 4 miles from its lower edge. From Philadelphia the ridge runs with the post road to Havre de Grace, where it is visible on both shores, although the tide extends 6 miles above, to the foot of the falls.

The Susquehannah, by the name of the Chesapeake, may be considered as running under the foot of the granite ridge almost as far as Baltimore, which city is built upon the foot of the ridge. At the river Patuxent, on the post road, the ridge appears again, but is lost under the incumbent soil, and is not again visible until it appears at Georgetown. The harder granite of the Potomac has resisted the force of the water more than the granite further to the north-east, and the tide reaches only 3 miles above its outrunnings. From the Potomac, the falls of Rappahannoc at Fredericksburgh, of James river at Richmond, Appomatox at Petersburg, Roanoke at Halifax, beyond which point my personal observation does not extend, point out the course of this ridge in a line near

ly parallel to the Blue ridge, diverging to the eastward as it extends southward.

Of the improvement of the natural navigation of our rivers leading to the sea, and of canals cut parallel to them.

The difficulties of the natural navigation of our rivers are: In spring,—the danger of wreck in the wild water of our rapids; in autumn,—obstructions created by rocky shoals; and, in most of them, rapids and falls impracticable at all times. The least expensive and most obvious means of removing the former are the blowing of the most prominent rocks, so as to straighten the channel, and procure a passage at low water. This has in almost all our rivers been attempted on a greater or less scale; and with various degrees of success. When injudiciously performed, and in rivers of rapid descent, and liable to great variation in the quantity of their water, more injury has been done than advantage obtained. Many of our worst obstructions act as natural dams, which holding up the water, create a large extent of excellent navigation above them. Of this the James river above Westham, and the Susquehannah above Chickisalonga and Hunter's falls, are instances in point. Such obstructions when removed, let down the water rapidly from above, without supplying deeper navigation below.

In a river of such magnitude as the Susquehannah; indeed, no gap or sluice artificially cut, can materially affect the rapidity of the stream, but in lesser rivers, great care is required, not only to prevent lowering the water above, but to avoid giving a new direction to the current, more mischievous in its effects than that which has been changed. But with whatever judgment the natural navigation of a river perplexed by rapids and shoals may be conducted, and however its descent may be thereby facilitated, its ascent cannot possibly be rendered more easy, in

the same degree. Thus for instance, although by the monies expended by the state of Pennsylvania and the Susquehannah canal company, on the natural navigation of the Susquehannah below Wright's ferry, it has been rendered much less dangerous to run down the distance of 41 miles, almost the whole of which is a tremendous rapid, from Columbia to the tide, and thereby to carry lumber, iron, and agricultural produce to Havre de Grace, and thence to Baltimore,—yet so difficult is the upstream navigation by the same route, even with the assistance of the Susquehannah canal, that the returns in imported articles have been generally purchased in Philadelphia and conveyed to Columbia or Middletown, above the rapids, by the Lancaster turnpike, thence to be boated to the country watered by the upper branches of the Susquehannah. And although the Philadelphia market has hitherto offered more advantages to the buyers of imported goods than that of Baltimore, yet the expense of transporting them 72 miles by land to Columbia, would, if there were a good navigation from Havre de Grace upwards, destroy this advantage.

The difficulty of carrying canals parallel to our great rivers, the scarcity of engineers possessing knowledge and integrity, the want of capital, and above all the erroneous dread of bold measures, and the fear of uselessly expending money in works hitherto unknown among us, has deterred those interested in improving our navigation, from deserting the beds of our rivers, while it was practicable to keep them. They have therefore had recourse to canals only where navigation was otherwise impossible; where obstructed by rocks, or broken by a cascade.

There cannot however be a reasonable doubt, that if in England, where, compared with the United States, the quantity of water in the rivers varies little between the driest and the wettest period of the year, a canal running parallel to a river, furnishes a much more certain and safe and equal and cheap navigation

than the river itself—it is infinitely more the case here. Unfortunately those of our canals which have been cut to pass the rapids and falls of our rivers, partake in a great measure of the inconveniences of the rivers themselves; some wanting water when the river is low, some incapable of being entered excepting at a particular height of the water in the river, some subject to constant accumulation of bars, and all of those with which I am acquainted, much less useful than the money expended on them ought to have made them.

Those canals, of which I now particularly speak, are, the James river canal, the Potomac canal, the Conewago, and Susquehannah canals. Of the canals north of the Delaware, and south of Virginia, I have not sufficient knowledge, nor can I speak of the Appomattox canal. It is, I believe, not liable to the same strictures in all points, which I shall make upon the others, but though I am well acquainted with the ground, I have not seen the manner in which the work has been executed.

One great and fatal error has been interwoven into the scheme of the other canals, excepting only that of the Potomac: They have been dug as much with a view to the erection of mills, as to the purposes of navigation. To fit them for mill-races, their descent is rapid, and their current strong. They are liable, of course, to the variation of the quantity of water in the river; they bring down with their current, the alluvium of the river; bars are formed in them, as well by this alluvium, as by the land wash; and their banks, where they are not of rock, or walled, are liable to perpetual wear by the current. The canal is, besides, itself an inconvenient rapid to those who would ascend it.

Besides these inconveniencies, the contracts binding the company to furnish to the millers the water, when it rises above a certain gage-selle, for an annual rent, or on other fixed and permanent terms, tie the canal company to the original construction

of the work, and forbid future improvement. For instance, if a lock were found to be useful above the highest mill, it could not be erected, because it would rob the mills below of their stipulated water; the inclination of the canal cannot be lessened, because it would have the same effect. In the James river canal, more than in any other which I have seen, this error, though now generally considered as a very great advantage, will at some future period be discovered and deplored. The Potomac canal, more especially that of the Little falls, has the same defect of a too rapid descent, although the object of a mill race is placed by their charter out of view. But its principal defect is of another kind, to which that of James river is also, but in a less degree, subject. It receives the wash of all the hills and ravines of the north bank, which ought to be discharged through culverts, or carried over bridges: and that legislative impartiality which has required the canal to enter the river at the very head of the tide, in order that Virginia may have an equal chance of becoming the depot of its commerce with Maryland, has very much injured its utility to the country at large.

In a still greater degree than the Potomac canal, the Susquehannah canal, beginning at the Maryland and Pennsylvania line, and ending at the head of the tide, has the defect, not only of receiving the landwash of the hills and ravines, but also two considerable rivers, the Conewingo and Octorara, partaking thus of all the danger arising from their inundations, and receiving their alluvium. This canal is also applied to the purposes of a mill race. Other inconveniences attend it, which arise from the most unfriendly nature of the river, and the local feelings of the state legislatures of Pennsylvania and Maryland, at the period of the incorporation of the company.

The Conewago canal, about 50 miles higher up the Susquehannah, is also a mill race, and is the property of an individual. It is of difficult entrance, which is to be regretted, as it ought to be the means

of passing a short but very dangerous fall of the river, which interrupts along extent of very good navigation.

Having thus pointed out the general and common defects of these canals, to which I may add the general want of proper slopes to their banks, I will now enter upon the very thankless task of giving an honest opinion respecting them in detail, viewing only the *public interests*, and perfectly conscious of the bearing of what I shall say, upon private feelings. These feelings, however, are extremely short-sighted; for nothing could be more advantageous to the individuals most interested, than those measures which would most benefit the public.

The James river and Appomattox canals stop short of tide water. The most important of these canals is that of James river. Upon the coal mines of James river our Atlantic sea ports will soon become dependent for their chief supply of fuel. That dependence exists already in respect to the fuel required for a variety of manufactures, and even now the smiths within 10 miles of our sea ports, require in order to carry on advantageous business, a supply of Virginian coal. There are three means (and I think only three)—by which the Virginian coal can be brought to the tide: 1. By a small canal and rail roads, immediately from the mines south of the river to the shipping tide water at Amptill or its neighbourhood, along the valley of Falls creek; distance, I believe, 20 miles. This is a route easily practicable and at a moderate expense, for Falls creek rises in the coal mines themselves. 2. By the turnpike road to Manchester opposite Richmond. This road has been sometime completed, and is of the highest utility. 3. By James river to the head of the falls, and thence by the canal to Richmond. This is for two thirds of the coal country, the best and most obvious route. For from all the mines the coal may easily be brought to the river on rail roads, and thence boated, independently of the cheaper conveyance which Tuckahoe creek might be made to yield to a

great extent of coal land now little worked. But of what adequate use is this navigation in boats carrying at an average 200 bushels of coal only, when, if the canal were well constructed, 1000 bushels might be as easily and cheaply conveyed; and when, on their arrival in Richmond, they must be unloaded, again loaded into carts and carried down by a bad road to the tide at Rockets, to be shipped? The Manchester turnpike, with all its expense of waggons, horses, and drivers, and the consequent waste of *labor*, *capital*, *food*, and *forage*, is a better, and I am told, as cheap a mode of conveyance.

The means by which the canal itself may be made much more useful, I will not consume your time and patience in detailing; what is most important, taking the whole subject into view, is to connect the canal, such as it is, with the tide.

In the year 1796, Mr. Weston, then engineer to the western navigation companies of the state of New York, was called to Richmond to give his advice and opinion on this subject. It amounted to this: to connect the basin with the foot of the falls, by a succession of ten or eleven locks in one tier, carrying the race of Ross's mill upon an aqueduct across the canal at the foot of the locks. With all deference to his talents, I cannot help remarking, that of all expensive projects of which I ever heard, this would have been one of the most useless. For independently of the excessive inconvenience and detention which such a tier of locks at the most busy part of a navigation would occasion, the boats would arrive at their foot, in a very considerable rapid, now impracticable, and which could only be made practicable by blowing up the rocky bed of the river. When arrived there, two miles of tide water must be encountered; to navigate which, these boats are wholly unfit. I cannot help thinking that the present mode of conveying the coal to Rockets is not much less eligible. I refrain from stating many other objections, which are professional, and which I believe

were, as well as those already mentioned, as evident to Mr. Weston as to myself; but objections of another nature, more powerful than mere physical difficulties, opposed every project excepting that which he proposed.

In order to connect the basin of the James river canal with the tide, a very simple means is offered by the nature of the ground. To do this it will be necessary to form a capacious basin at Rockets, communicating with the tide by one or more locks. To carry a canal from thence along the level bank of James river to Shockoe creek. A cheap aqueduct of one arch of 30 feet span will carry the work across the creek into the back street. The canal will then go up the back street, mounting by successive locks, not more than two in each tier, into the basin. The canal from Rockets to the basin on Shockoe hill, should be of 9 feet draft of water, and the locks 100 feet long and 18 feet wide. This canal would of course bring vessels which navigate our coasts and bays and run out to the West India islands, into the basin on Shockoe hill.

The legislature of the state of Virginia, (for the commonwealth is deeply interested in the stock) has from time to time expressed great anxiety on the subject of completing this canal. But the dread of unforeseen difficulties and risks in carrying the work below the basin, and the value and productiveness of the stock in its present state, have hitherto overbalanced this anxiety. But considering Richmond as the principal source of fuel to the cities on our sea coast, at least until the mines of cape Breton shall supply us, I feel a national sentiment in deeply regretting the very fatal policy which maintains and supports the error, and the mutilation of this most important work. I will not at the same time deny, that when it is considered that those who projected and executed the canal were men of no acquaintance either with general science, or with this particular branch of art, and knew nothing of canals but from

books or hearsay, they have already done wonders. They deserve the thanks of their state, and of the union. But the work should not stop where they have left it. Nature, has perhaps, done more for Richmond than for any scite where a city has been planted. For 10 miles above the city on both sides, and upon several islands of the stream, there are innumerable mill seats, supplied by one of the noblest rivers in the union. Immediately above the head of the falls lies an inexhaustible treasure of coal. Every art and manufacture to which human ingenuity can employ fire and water, may be here carried on with the least expense. From above, an easy and wide spreading navigation, collects on this spot all the raw materials which our climate can produce; below, a river capable of bearing sea vessels sufficient for every trade, but that across the ocean, is ready for the exportation of its merchandize. The town itself is placed on a healthy and commanding ground. But to improve these advantages to the utmost extent to which our population is equal, nothing would so much contribute as the completion of the Richmond canal.

I have dwelt specially on the coal trade to which this canal is subservient, as of first rate national importance. It is of no less importance to the state of Virginia as a means of conveyance of agricultural produce. As you will receive an answer in detail to your queries relative to the amount of all the sorts of produce carried upon it, and of its actual trade, I will not add any thing further to what I have already said on the subject, but to observe,—that at some distant period, the Chickahominy, a river rising in the coal country, and discharging itself into James river miles below Richmond, where ships may take in their cargoes, offers a means of carrying down the coal destined for distant exportation.

A canal has often been projected for passing the falls of the Rappahannoc at Fredericksburg. There is no reasonable hope, however, that this work can

soon be executed. The ravine of the river at the falls on either side is so abrupt, rocky, and irregular that great expense must be incurred to effect it,—an expense not likely to be repaid by its trade for many years.

A canal to connect the Rappahannoc with the Potomac, a few miles below Fredericksburg, across the northern neck, has also been spoken of. It would be a highly useful work, but would require a tunnel of 2 or 3 miles. I believe it could be executed at an expense not greater than the tolls would remunerate. Such a canal, however, does not belong to the class of which I am now speaking.

The Potomac canal consists of two parts,—one to pass the Great falls 14 miles above Georgetown,—the other to pass the Little falls. The errors committed in the construction of the work have been enumerated above. The trade of this canal, especially during the year 1807, has been so great, that there appears every prospect of its becoming a productive work,—*in those years* in which there is a considerable and equal quantity of water in the river. But upon this circumstance it must always depend. The information respecting it, which can be obtained from the company, on the spot, renders it unnecessary for me to say more upon it.

No attempt at the improvement of the navigation of any of the rivers of Maryland between the Susquehannah and the Potomac, has been made, nor is there in the prospects of advantage to be derived from the navigation of the two Patuxents, the Patapsco, or any of the lesser rivers falling into the Chesapeake, any thing which could at present tempt capital into such an undertaking.

But the Susquehannah itself has been for many years the object of almost all the attention directed in the states of Maryland and Pennsylvania to the improvement of our internal navigation. About 6 miles above Havre de Grace, this mighty river meets the tide. The place is now known by the name of

Smith's ferry. The map of the river from thence up to Wright's ferry (Columbia) in Pennsylvania, which I made in the year 1801, when directing the works carried on for the improvement of the natural bed of the river, and which by favor of the governor of Pennsylvania, I am able to exhibit with this memoir, will explain the nature of this part of the river very minutely, being drawn to a very large scale. The whole of this extent is one tremendous rapid, which in fact continues to the N. W. side of the Chickalunga hills, 3 miles above Columbia. The rapid is not every where of equal velocity, or equally dangerous. Wherever the river crosses a valley of limestone or slate, the rocks are worn down into a smoother and wider bed: but when it has to cross a ridge of granite, its course is immediately broken by irregular masses and range of rocks; its bed is narrow and enclosed by precipices, and its torrent furious and winding.

The Chickisalunga falls can be descended without danger, and no attempt to open them has been thought necessary. The ridge of granite hills through which they break, bounds on the N. W. the beautiful limestone valley of Columbia. Across this valley the river runs rapidly, but smoothly. Another narrow ridge of granite hills crosses the river immediately below Columbia, over which the river falls rapidly, and then enters the wider limestone valley known by the name of the Jochara valley. The river spreads here to the width of three miles, its stream is gentle though rapid, and it abounds in beautiful and fertile islands. It then suddenly contracts and is received into the narrow ravine which it has *sawed* down in the granite hill called Turkey hill. From its first entrance into the Turkey hill, to the tide, there is no part that deserves the name of a sheet of smooth water. When the river is full, the whole ravine about half a mile in width contains only one furious torrent in which few rocks comparatively are to be seen above the water; but the danger is

not the less, and very skillful pilots, and many and stout hands are required to carry a boat or an ark safely down. But in the autumn, and in a dry season, the river itself can for 6 miles scarcely be seen, and its bed appears a barren and dry waste of irregular rocks, among which the loud roaring of water is only *heard*: for, from the Turkey hill to near the mouth of Conestogo, the whole river is discharged through a channel generally about 60 feet wide, in the greatest part of which the depth and the rapidity of the torrent is such, that it has not been fathomed. About a mile below the mouth of Conestogo, a narrow limestone valley touches the river on the N. E. side, but on the west shore not a trace of Limestone is to be seen. Four miles below Burkhalter's ferry, the river arrives at the high range of granite hills, abounding in copper, in which the gap mine is situated, and at a place called M'Call's ferry, it narrows to the width of 16 perches. Here I attempted to find bottom with a line of 180 feet, but failed, notwithstanding every precaution taken to procure a perpendicular descent of the weight attached to it. Through this pass the water is rapid, but smooth and safe. The river rises here rapidly and very suddenly after the fall of rain above; and it will never be possible to erect a safe bridge at this place, so often mentioned as the most practicable. The obstructions to navigation by 3 rapids below M'Call's, is not so considerable as to endanger the arks and boats that descend, until they arrive at the Baldfriar falls, below Peachbottom and about 8 miles above the tide. From M'Call's to the slate valley of Peachbottom, the river is filled with islands called the Bear islands. Across the valley of Peachbottom, and above the Baldfriar falls, the river is wide and safe. The best natural navigation, and that always pursued by boats descending by the natural bed of the river, is on the west side, from the foot of the bear islands. Above that point to Columbia, the best passage is on the east side. The most dangerous falls below Peach-

bottom were Amos's and Hector's falls, on which many wrecks annually occurred until the late improvements of the navigation were made.

From this description it may easily be imagined that if the descent of the river with boats loaded with produce was dangerous and difficult, the ascent was still more so. The natural obstructions were besides increased by fish-dams in every part of the river, and the rival interests of the states of Pennsylvania and Maryland prevented, for many years, every attempt at artificial improvement of the bed of the river. In the mean time each state took measures to go as far towards rendering the navigation of this river useful to their respective interests, as their means and limits would permit; and a company was incorporated in Maryland, to make a canal from the Maryland line to the tide, to pass all the obstructions of the river of the eight lowest miles; and in Pennsylvania two companies were also incorporated, the one to connect the Susquehannah with the Schuylkill, by a navigation taken out above all the dangerous falls, and the other to connect the Schuylkill with the Delaware. The objects of none of these companies were advantageously accomplished. The Susquehannah canal company have, however, completed a navigable canal, liable to the objections which I have above noticed. The Pennsylvania companies have made considerable progress in the works, under the direction of a very able engineer, Mr. Weston, but have not completed either canal so as to render them useful or productive.

At last, in the year 1801, the states of Maryland and Delaware having passed laws incorporating a company for the purpose of cutting a canal between the Chesapeake and Delaware, a former law of Pennsylvania, appropriating 10,000 dollars to the removal of obstructions in the Susquehannah, went into effect; and the late Colonel Fred. Antes, than whom no man was better fitted to accomplish its object, was charged with its execution. But he died on his arrival at the

river, and the direction devolved upon me. The enclosed report to the legislature on this subject, details the extent of the work executed, and the principles on which I proceeded in the attempt to make a practicable and safe navigation both up and down the river. I will here only repeat that all my exertions were bent to force through all obstructions, a channel clear of rocks, of 40 feet wide, close to the Eastern shore, never leaving any rock upon which a vessel could be wrecked between the channel and the shore,—so that in the most violent freshes a boat should always be safe, by keeping close in shore. Rocks of immense magnitude were therefore blown away, in preference to the following a crooked channel more cheaply made, but more difficult and dangerous, and varying in safety and practicability, according to the degree of the rise of the river. There is however one part of the navigation in which the bed of the river must forever be pursued, namely, from the Indian steps above M'Call's to below the gap at M'Call's :—a part of the navigation, which, if art can conquer it, must be undertaken in a state of the country infinitely more abounding in wealth and population than at present.

OF THE CHESAPEAKE AND DELAWARE CANAL.

Having now answered that part of your inquiry which relates to the general subject of canals, I come to the particular merits of the Chesapeake and Delaware canal, of which you have requested me to give special information ; together with my opinion on its location, unbiassed by any interests but those of the public.

The very able report of the committee to whom your letter to the president and directors of the company was referred, and who did me the honor to confer with me on the subject, conveys to you all the information which can be given of the history of the

company, their pecuniary resources and difficulties, the motives that directed their choice in the location of the work, and the system under which it was begun and pursued. Every thing also that can be collected by the most indefatigable enquiry as to the probable proceeds of the canal, and the advantages it offers to those who have adventured in it, is also detailed; and there remains to me only the task of giving you that professional information, which as engineer to the company, I have obtained; and to explain to you the means of executing it, as far as they are determined by the nature of the soil and the levels of the country.

The alluvial land lying below that part of the granite ridge which crosses the peninsula from the ferry opposite to Havre de Grace; reaching the shores of the Delaware at Wilmington, may be considered as a regular inclined plane, sloping gradually to the south-east at the rate of about 6 inches in a mile. Immediately below the granite ridge,—that is, along the foot of Gray's hill, Iron hill, and along the south bank of Christiana creek, which runs parallel to, and close under, the ridge,—its highest inequalities seldom exceed 80 feet, nor does the common surface fall below 70 feet above the tide of the Chesapeake at high water. This plane extends from the granite ridge to the ocean,—and the only considerable depressions to be found in it, are the beds of the land drains, which are worn down into it and produce the appearance of vallies; but there are no insulated hills whatever, and the vallies are merely depressions of the ground below the plane. Hence it is evident, that by going round the heads of the water courses, a line of canal may be found across the peninsula between any two points on the opposite bays, in which the variation of level on the summit will be very small, and that by making the bank out of the spoils of the cut, a canal may be made at the smallest possible expense of digging and removing earth, and at no expense whatever for works of masonry, except-

ing at each end, where the descent requires the construction of locks. For by following the ridge dividing the waters which drain into opposite creeks, the necessity of culverts and aqueducts may be wholly avoided. The soil is also of the kind most easily cut, being generally of a sandy loam on and near the surface, and beds of good clay are found in abundance for all purposes of puddling.

The advantage of so level and soft a surface for the cut is counterbalanced by the total absence of water to supply it. This circumstance is very important in determining the choice of the line of the canal, among so many that are equally practicable; for as all its water must be brought from the higher grounds upon the ridge, its location ought to be as near to the ridge as possible, in order that the feeder being short, the leakage and evaporation of a long feeder may be avoided. The location of the two ends of the canal does not, however, entirely depend upon its general course along the summit; and a great variety of terminations have been proposed, as equally eligible, both on the Chesapeake and the Delaware side. The former, after long and careful examination, has been decided in favor of Welch point, where there has, within the memory of man, been no diminution in the depth of the water, which is below the deposit of alluvium from Elk creek, and where the water is so wide and so deep, as to furnish a very capacious basin for many years to come, for the inconsiderable land wash of Back creek and the small drains in the neighbourhood. But on the Delaware side much difference of opinion has prevailed. The summit level of the canal in every case must reach the principal road leading from Christiana bridge down the peninsula, near a tavern called the Bear. This place is only two miles distant from Hamburg or Red hook, on the bay of Newcastle, and a cheap and short cut might be made to either of these points, especially to Red hook, did not two considerations forbid it,—the broad and wild water of

the bay, and its shallowness at a great distance from the shore, there being only 4 feet 6 inches at low water. Newcastle, is the next eligible point. Newcastle is situated on a prominent point, which is swept both by the flood and the ebb tide. There will therefore be always deep water at the *outer* wharves and piers at that place, and less than 21 feet has not been found on the outside of any of the piers lately erected; or formerly, and even at present, at the wharves, excepting only where the eddy occasioned by the piers has accumulated soft banks of mud.

There could not be a moment's hesitation in fixing the termination of the canal at Newcastle, unless the following reasons should be thought to outweigh the advantages of the best water in the Delaware, and the shortest navigation across the peninsula, which this point offers. It is in the first place feared, that in time of war, when the canal would be invaluable as a means of conveyance of military stores and bodies of men, an enemy's ship of war might destroy the works at Newcastle in a sudden incursion, and return to sea, before the mischief could be prevented. It is further urged, that the mouth of the canal on the river below the tide would be liable to be filled up, in a very short time, as are all places on the Delaware where there is an eddy.— And it is also alledged, that Newcastle is situated so far below Philadelphia (33 miles), that unless with a favorable wind, dull sailing vessels cannot reach Newcastle in one tide, when they might reach the mouth of Christiana, 4 miles higher up the river, and go up the creek with the flood.

The first argument, appears to me to be deserving of consideration in a national point of view, and a small fort would be necessary to defend the mouth of the works against an enemy who should attempt to land, to blow them up. But they could not be injured even by shells beyond the destruction of the gates, which a few hours could put again into repair. To obviate the second objection it would be necessa-

ry to place the tide lock as far out as possible, and to carry out and wharf the side of the canal below the lock as far into the river, as the most projected wharf. The line of the wharves is now limited to 600 feet beyond the lowest street, called Water street, and unless further protruded into the river by a law of the state, this distance presents no formidable difficulty to the work, and places the utmost extension of the wharves, beyond the present time. The third objection is not without foundation. But the narrow and crooked navigation of Christiana creek, presents infinitely more causes of delay than the distance of four miles in the bold navigation of the Delaware. There is however in these objections enough to render it an object of infinite importance both to the nation and to the company, to avail themselves of both the eastern terminations of the canal, and to make a cut also from the Bear to the Christiana creek, about three miles above Wilmington, on a line not altogether so favorable, nor so short as that to Newcastle, but presenting no difficulties of importance whatsoever. From the point (Mendenhall's) at which the termination is proposed, 10 feet may be carried out to the river Delaware. The objections to this termination are: the tedious and very crooked navigation of the creek for seven miles to the Delaware. The drawbridge at Wilmington, which must be passed; but more than any other, the opposition of the tides of Delaware and Christiana creek. For if a boat comes into the canal at Welsh point at high water, and passes across in six hours, she will find half flood in Christiana, and must wait the ebb to go down. On her arrival in the Delaware in two and a half or three hours, she will have again to wait three or four hours for the flood to proceed to Philadelphia, or up the Brandywine to the celebrated mills, the interests of which are well worthy of attention. Whereas a vessel arriving at Newcastle and finding the flood tide running, which will always happen if she comes to Welsh point with a flood tide, may at once proceed

up the Delaware, or up the Brandywine or Christiana creek, without delay. It must also be mentioned, that without a favorable tide, it is difficult to work down the Christiana creek against the wind, which is always unfavorable in some reach or other of its crooked navigation, when on the contrary, there is ample room in the Delaware to use all advantages of wind and tide.

On the other hand, it must be urged in favor of Christiana creek, that there is navigable water for boats drawing 8 feet above the proposed termination of the canal, as far as Christiana bridge, and that the navigation may be pushed still higher;—that the little town of Newport is now the depot of the produce of a very extensive and fruitful country extending into Lancaster county, and is 20 miles nearer to Lancaster than Philadelphia, and that to connect so important a field of productive business immediately with the canal, it may be worth while to incur an encreased expense and some inconvenience and delay in the mere *thoroughfare* navigation: and it may be added, that the large fixed capital of the town of Wilmington, far exceeding that of Newcastle, demands from the good policy, as well as the good will of the company or the nation, some consideration.

Well aware of the thankless task of giving a decisive and honest opinion on either side, I content myself with furnishing the materials of determination to you, and proceed to describe the nature and principles of the work actually executed in the feeder, and proposed for the canal.

Between the waters of the Chesapeake and the Delaware there are three streams which, rising in the high land above the canal, may be brought down to it as feeders, the Christiana creek, the Whiteclay creek, and the Elk itself.

The Elk and the Whiteclay are nearly equal in the regular quantity of water they supply, the Christiana is both smaller and more irregular. The Elk de-

scends in a very crooked and rapid stream, 84 feet in four miles from Elk forge to the tide near Elkton, and unites with the wide water of the Chesapeake at Turkey point. The ridge that separates its waters from those of the Delaware terminates in a high insulated hill, called Gray's hill, which is united to the high land by a low and narrow ridge, crossing the post road on the boundary line of Delaware and Maryland. The Christiana creek is the first water falling from the high land into the Delaware. It collects all the waters that fall round the high insulated hill called Iron hill, at the N. E. foot of which it turns to the N. E. and, running in that direction under the foot of the granite ridge into the Delaware, receives the Whiteclay, Redclay and Brandywine in its course, and also numerous land drains from the level land to the South East. Of these three streams it has been ascertained that they may all be brought to the canal, but the Elk with the least expense and the shortest cut. The vallies in which they all run having been worn in deep and rocky land, and branching into deep ravines, the beds of rapid rivulets, offer great difficulties to the work necessary to divert their course.

In the Elk feeder, the canal is cut in the rock for about half a mile; embankments are made across several vallies, but the principal difficulty and expense consisted in cutting through a tongue of high land called Bellhill, through which the digging is 30 feet for near half a mile, and again through the dividing ridge, to the depth of 25 feet for above half that distance; these two difficulties have been conquered. Another smaller hill remains to be cut through, but it may be avoided by a circuitous cut, much less expensive, but also much less eligible. On the Delaware side of the ridge, the feeder is cut through a swampy flat of more than a mile in length, while the descent is only six inches. The general elevation of this flat is 86 feet above the tide, and as the head of the feeder at Elk forge is only 84 feet, it could have

little descent, and falls only 2 inches in a mile. It has on this account been made a spacious canal of 3 feet 6 inches water, 22 feet 6 inches on the surface, and 12 feet at the bottom, affording as far as it goes a good and valuable inland navigation. The feeder is 6 miles in length; at the end of 5 miles is a lock for the passage of boats, and a side cut to communicate with the reservoir. A contiguous valley offers the means of making a reservoir, of more than a hundred acres. It has been proposed to embank 30 acres for this purpose. The lock is of 10 feet lift. The reservoir will be level with the upper feeder, of course 10 feet above the level of the canal, and under such a head will give the canal a plenteous and rapid supply as it is wanted. Below the lock the feeder is 5 feet deep, and 27 feet on the surface of the water: it will join the canal about a mile west of Aikentown. In the construction of the feeder permanence has been a very principal consideration. All the culverts are of solid masonry; no land water can run into the cut; the banks are sloped as 2 to 3; the embankments are well puddled, and the piers of the bridges are of hewn stone.

From the description which I have given of the soil of the peninsula, it is evident that the amount of digging constitutes the chief expense of the canal. To lessen this amount and to shorten the canal, it is proposed to quit the level in three places, and to cross three land drains that lead into Christiana creek, one at Aikentown, and two between Aikentown and the Bear. Small aqueducts and short embankments only are necessary to effect this. If the canal should terminate at Newcastle, a narrow marsh must also be crossed,—if at Christiana, deeper cutting must be encountered.

But neither of these difficulties increase the expense of the canal more than \$7,500 each, beyond that of the same length of the general cut.

On all other points the report of the committee

furnishes ample information; and I will only add,—that neither in Europe, nor in our own country do I know a line of inland navigation, which by so short a distance, and at so easy an expense, unites such extensive and productive ranges of commercial intercourse.

With the highest respect,

I am yours,

(Signed)

B. H. LATROBE.

ALBERT GALLATIN, Esq.

Secretary of the Treasury.



April 1, 1808.

POSTSCRIPT.

IN the questions proposed to me by you, the subject of artificial roads was comprehended. But being informed by you that the canal companies of Pennsylvania and Maryland, had transmitted to you ample accounts of their undertakings, and as in their works, experience has taught a system and mode of execution, of the most perfect kind; I have refrained from adding any thing to the information thus acquired. It has however occurred to me, that a few remarks upon rail roads might not be unacceptable to you, especially as the public attention has been often called to this sort of improvement, and the public mind filled with very imperfect conceptions of its utility.

Rail roads may be constructed of iron or of timber. The most durable (but also the most expensive) rail roads, consist of cast iron *rails* let down on stone foundations; such roads will last for ages. Cast

iron rails secured on beds of timber, are sufficiently durable for our country, and of moderate expense. Rail roads entirely of timber, are fit only for temporary purposes.

A rail road consists of two pair of parallel ways, one pair for going, the other for returning carriages: single roads with occasional passing places, are applicable to some situations, and are of course less expensive. I will concisely describe the road best adapted to the objects that in our country can be attained by it:—*The rails* are of cast iron, and consist of a tread and a flanch, forming in their section the letter \sqsubset . The tread is 3 inches wide, the flanch 2 inches high. The rails need not be more than $\frac{1}{4}$ of an inch *average* thickness, and they may be cast in lengths of 5 to 6 feet each; each rail will, at six feet length, contain 225 cubic inches, which, at 4 inches to the pound, is 56 lb. each rail, or 1 cwt. for every 6 feet in length of the road, or 44 ton per mile.

In order to form a road of these rails, they must be laid at the distance of from 3 1-2 to 5 feet (according to the carriage that is to run upon them) parallel to each other; the ends of every two pair of rails being let and pinned down into a piece of timber lying across the roads, the holes for the pins must *be cast* in the rails. These pieces of timber may be of any form, provided they are level at the top, and they cannot be a great part of the expense of the road in any situation. The most durable timber is certainly the best: but no timber can be very durable in the situation it must occupy on the surface, and partly or wholly covered with earth. The perfection of the road consists in the parallel rails being laid perfectly level with each other across the road, and perfectly jointed. In most parts of the union the rails could, I think, be delivered at from 80 to \$ 90 per ton, and in many at \$ 60—but taking \$ 80 as the average on the spot, the road will cost—

Rails delivered, 44 ton, at \$ 80,	3,520
Levelling the road, very uncertain, but I will suppose as an average for levelling and filling in with good gravel or broken stone, \$ 2 50 per perch, or per mile, - -	800
Timber and bedding at 50 per rail, - -	440
Incidents and superintendence, - -	240
	<hr/>
	5,000
For a set of returning ways, - -	5,000
	<hr/>
Total per mile, - -	<u>\$ 10,000</u>

The carriages which travel on these roads may be of various dimensions, agreeably to the material to be conveyed, and the necessary angle of the road. They have low cast iron wheels fast upon the axle, which turns round. Thus, the two wheels on the axle making the same number of revolutions in the same space of time, the carriage necessarily goes straight forward, and cannot be thrown off the ways by any small obstruction on one side.

The principle upon which such astonishing loads may be drawn on the ways by a single horse, is the diminution of friction in the greatest possible degree. On a good rail road, descending under an angle of only one degree, one horse may draw eight tons in 4 waggons of two tons each without difficulty. The astonishing loads drawn upon rail roads by single horses in England, have induced many of our citizens to hope for their early application to the use of our country. I fear this hope is vain; excepting on a very small scale, and that chiefly in the coal country near Richmond. For it is evident that upon a rail road no other carriage but that which is expressly constructed for the purpose, can be employed,—and that to render a rail road sufficiently saving of the expense of common carriage, to justify the cost of its erection, there must

be a very great demand for its use. But the sort of produce which is carried to our markets is collected from such scattered points, and comes by such a diversity of routes, that rail roads are out of the question as to the carriage of common articles. Rail roads leading from the coal mines to the margin of James river, might answer their expense, or others from the marble quarries near Philadelphia to the Schuylkill. But these are the only instances within my knowledge, in which they at present might be employed.

There is, however, a use for rail roads as a temporary means of overcoming the most difficult parts of artificial navigation, and for this use they are invaluable, and in many instances offer the means of accomplishing distant lines of communication which might otherwise remain impracticable, even to our national resources, for centuries to come.

Mr. Fulton's Communication.

(F)

SIR,

BY your letter of the 29th of July, I am happy to find that the attention of Congress is directing itself towards the opening of communications through the United States, by means of roads and canals; and it would give me particular pleasure to aid you with useful information on such works, as I have long been contemplating their importance in many points of view.

But a year has not yet elapsed since I returned to America, and my private concerns have occupied so much of my time, that as yet I have acquired but very little local information on the several canals which have been commenced.

Such information, however, is perhaps at present not the most important branch of the subject, particularly as it can be obtained in a few months at a small expense, whenever the public mind shall be impressed with a sense of the vast advantages of a general system of cheap conveyance.

I hope, indeed, that every intelligent American will in a few years, be fully convinced of the necessity of such works to promote the national wealth, and his individual interest. Such conviction must arise from that habit of reflection which accompanies the republican principle, and points out their true interest on subjects of political economy. From such reflections arises their love of agriculture and the useful arts, knowing them to augment the riches and happiness of the nation; hence also their dislike to standing armies and military navies, as being the means of increasing the proportion of non-productive individuals, whose labor is not only lost, but who must be supported out of the produce of the industrious inhabitants, and diminish their enjoyments.

Such right thinking does great honor to our nation, and leads forward to the highest possible state of civilization, by directing the powers of man from useless and destructive occupations, to pursuits which multiply the productions of useful labor, and create abundance.

Though such principles actuate our citizens, they are not yet in every instance, aware of their best interests; nor can it be expected that they should perceive at once the advantages of those plans of improvement which are still new in this country. Hence the most useful works have sometimes been opposed; and we are not without examples of men being elected into the state legislatures for the express purpose of preventing roads, canals and bridges being constructed. But in such errors of judgment our countrymen have not been singular. When a bill was brought into the British parliament 50 years ago, to establish turnpike roads throughout the kingdom, the inhabitants for 40 miles round London petitioned against such roads; their arguments were, that good roads would enable the farmers of the interior country to bring their produce to the London market cheaper than they who lived nearer the city and paid higher rent; that the market would be overstocked, the prices diminished and they unable to pay their rent, or obtain a living. The good sense of parliament, however, prevailed; the roads were made, the population and commerce of London increased, the demand for produce increased, and he who lived nearest to London still had a superior advantage in the market.

In like manner I hope the good sense of our legislature will prevail over the ignorance and prejudice which may still exist against canals. And here an important question occurs, which it may be proper to examine with some attention in this early stage of our public improvements,—whether, as a system, we should prefer canals to turnpike roads? Our habits are in favor of roads; and few of us have con-

ceived any better method of opening communications to the various parts of the states. But in China and Holland, canals are more numerous than roads; in those countries the inhabitants are accustomed to see all their productions carried either on natural or artificial canals, and they would be as much at a loss to know how we, as a civilized people, could do without such means of conveyance, as we are surprised at their perseverance and ingenuity in making them.* England, France, and the principal states of Europe commenced their improvements with roads; but as the science of the engineer improved, and civilization advanced, canals were introduced, and England and France are now making every exertion to get the whole of their heavy productions waterborne, for they have become sensible of the vast superiority of canals over roads.

Our system perhaps ought to embrace them both: Canals for the long carriage of the whole materials of agriculture and manufactures, and roads for travelling and the more numerous communications of the country. With these two modes in contemplation, when public money is to be expended with a view to the greatest good, we should now consider which object is entitled to our first attention. Shall we begin with canals, which will carry the farmer's produce cheap to market, and return him merchandize at reduced prices? Or shall we first make roads to accommodate travellers, and let the produce of our farms, mines and forests, labor under such heavy expenses that they cannot come to market?

To throw some light on this interesting question, I will base my calculations on the Lancaster turnpike road. There the fair experiment has been made to penetrate from Philadelphia to the interior country, and the mode of calculation here given will serve for drawing comparisons on the utility of roads and

* The royal canal from Canton to Peking, is 825 miles long, its breadth 50 feet, its depth 9 feet.

canals, for all the great leading communications of America.

From Philadelphia to the Susquehannah at Columbia, is 74 miles; that road if I am rightly informed, cost on an average, 6,000 dollars a mile, or 444,000 for the whole. On it, from Columbia to Philadelphia, a barrel of flour, say 200 weight, pays one dollar carriage. A broad wheeled waggon carries 30 barrels or 3 tons, and pays for turnpike 3 dollars; thus for each ton carried the turnpike company receives only one dollar.

I will now suppose a canal to have been cut from Philadelphia to Columbia, and with its windings to make 100 miles, at 15,000 dollars* a mile, or for the whole 1,500,000 dollars. On such canal, *one man, one boy and horse*, would convey 25 tons 20 miles a day,† on which the following would be the expenses:

One man,	- - - - -	1 00
One horse,	- - - - -	1 00
One boy,	- - - - -	50
Tolls for repairing the canal,	- - - - -	1 00
Tolls for passing locks, inclined planes, tunnels and aqueducts,	- - - - -	1 00
Interest on the wear of the boat,	- - - - -	50
Total,		<u>\$ 5 00</u>

This is equal to 20 cents a ton for 20 miles, and no more than one dollar a ton for 100 miles, instead of 10 dollars paid by the road. Consequently for each ton carried from Columbia to Philadelphia on the canal, the company might take a toll of six dol-

* On averaging the canals of America, 15,000 dollars a mile will be abundantly sufficient to construct them in the best manner, particularly if made on the inclined plane principle, with small boats, each carrying 6 tons.

† One horse will draw on a canal, from 25 to 50 tons, 20 miles in one day. I have stated the least they ever do, and the highest rate of charges, that no deception may enter into these calculations.

lars instead of one, which is now got by the road; and then the flour would arrive at Philadelphia for 7 dollars a ton instead of 10, which it now pays. The merchandize would also arrive at Columbia from Philadelphia, for three dollars a ton less than is now paid; which cheap carriage both ways would not only benefit the farmer and merchant, but would draw more commerce on the canal than now moves on the road, and thereby add to the profits of the company.

But to proceed with my calculations, I will suppose that exactly the same number of tons would move on the canal that are now transported by the road. Again, let it be supposed that at one dollar a ton the turnpike company gains five per cent. per annum on their capital of 444,000 dollars, or 22,200 dollars, consequently 22,200 tons must be carried, which at six dollars a ton to the canal company, would have given 133,200 dollars a year, or 8 1-2 per cent. for their capital of 1,500,000 dollars.

The reason of this vast difference in the expense of carriage by roads or canals, will be obvious to any one who will take the trouble to reflect, that on a road of the best kind four horses, and sometimes five, are necessary to transport only three tons. On a canal one horse will draw 25 tons, and thus perform the work of 40 horses; the saving therefore is in the value of the horses, their feeding, shoeing, geer, waggons, and attendance. These facts should induce companies to consider well their interest, when contemplating an enterprise of this sort, and what would be their profits, not only in interest for their capital, but the benefit which their lands would receive by the cheap carriage of manure and of their productions.

In considering the profit to accrue to a company from a canal instead of roads, there is another important calculation to be made, and for that purpose I will proceed with the Lancaster turnpike, supposing it to extend to Pittsburg, 320 miles. On which

the carriage being at the rate now paid from Columbia to Philadelphia, that is 10 dollars a ton for 74 miles, the ton from Pittsburgh would amount to 42 dollars, at which price a barrel of flour would cost 4 dollars in carriage, an expense which excludes it from the market. Thus grain, the most important and abundant production of our interior country, and which should give vigor to our manufactures, is shut up in the districts most favorable to its culture; or to render it portable and convert it into cash, it must be distilled to brutalize and poison society. In like manner all heavy articles of little monied value, can only move within the narrow limits of 100 miles; but were a canal made the whole distance, and by one or more companies, they might arrange the tolls in the following manner, so as to favor the long carriage of heavy articles.

The expense of man, boy and horse, as before stated, would cost only 3 dollars to boat one ton of flour 300 miles, this is 30 cents a barrel; suppose then, that the company receive 70 cents a barrel or 7 dollars a ton, flour could then come from Pittsburgh to Philadelphia for one dollar a barrel, the sum which is now paid from Columbia; thus the canal company would gain \$ 7 a ton by a trade which could never move through a road of equal length. Here we see that on canals the tolls may be so arranged as to draw to them articles of little monied value, and it would be the interest of the company or companies to make such regulations. But on turnpike roads no such accommodation of charges in proportion to distance, can be effected, because of the number of horses which cannot be dispensed with.* Even were the roads made at the public expense and toll free, still the carriage of one ton for 300 miles would cost at least

* In my work on small canals, published in 1796, page 140, there is a table shewing a mode of regulating the boating and tonnage in such manner, that a ton may be transported 1300 miles for 5 dollars. Yet by this method canal companies would gain more toll than by any other means yet practised.

35 dollars. But were canals made at the public expense, and no other toll demanded than should be sufficient to keep them in repair, a ton in boating and tolls would only cost 3 dollars for 300 miles; and for 35 dollars, the sum which must be paid to carry one ton 300 miles on the best of roads, it could be boated *three thousand five hundred miles*, and draw resources from the centre of this vast continent.

But striking as this comparison is, I will still extend it. The merchandize which can bear the expense of carriage on our present roads to Pittsburgh, Kentucky, Tennessee, or any other distance of 300 miles, and which for that distance pays 100 dollars a ton, could be boated on canals *ten thousand miles for that sum*.

As these calculations are founded on facts which will not be denied by any one acquainted with the advantages of canals, it is the interest of every man of landed property, and particularly of the farmers of the back countries, that canals should be immediately constructed and rendered as numerous as the funds of the nation will permit, and the present population requires; and as inhabitants multiply most towards the interior and must extend westward, still moving more distant from the sea coast and the market for their produce, it is good policy and right that canals should follow them. In 25 years our population will amount to 14 millions; two-thirds of whom will spread over the western countries. Suppose then that 3,500,000 dollars were annually appropriated to canals, such a sum would pay for 300 miles of canal each year, and in 20 years we should have 6000 miles circulating through and penetrating into the interior of the different states; such sums, though seemingly large, and such works, though apparently stupendous, are not more than sufficient to keep pace with the rapid increase of our population, to open a market and carry to every district such foreign articles as we near the coast enjoy. With

this view of the subject, arises a political question of the utmost magnitude to these states—which is—

That as our national debt diminishes, and the treasury increases in surplus revenue, will it not be the best interest of the people to continue the present duties on imports, and expend the products in national improvements?

To illustrate this question, I will state some examples of the rate of duties and the expense of carriage, to prove that by keeping on the duties and making canals with the revenue, goods in a great number of instances will be cheaper to the consumer, than by taking off the duties, and leaving the transport to roads.

FIRST EXAMPLE :

Brown sugar pays in duty, two and a half cents

a lb. or for 100 lb. - - - - - \$2 50

It pays for waggoning 300 miles, - - - - - 5 00

Total, \$7 50

By the canal, it would cost in boating 15 cents for 300 miles; consequently the boating and duty would amount to \$2 65; therefore, by keeping on the duty and making canals, sugar would arrive at the interior, 300 miles, for \$2 35 the hundred weight cheaper than if the duties were taken off and the transport left to roads.

SECOND EXAMPLE :

One bushel of salt, weighing 56lb. paid in

duty, - - - - - \$0 20

To carry it 300 miles by roads, the expense is 2 50

Total, \$2 70

By the canal it would cost for boating 300 miles, seven and a half cents. By keeping on the duties and making the canals, it would arrive to the interior

consumer at \$2 52 1-2 the bushel cheaper than were the duties taken off, and the transport left to roads.

THIRD EXAMPLE :

Molasses pays 5 cents a gallon duty, this is for	
100 lb. - - - - - -	\$0 75
It pays for waggoning 300 miles, -	5 00
	<hr/>
Total,	<u>\$5 75</u>

By the canal the carriage would cost 15 cents, and it would arrive at the interior, at \$4 10 the hundred weight, or 27 cents a gallon cheaper than were the duties taken off, and the transport left to roads.

Numerous other articles might be stated to shew that the real mode of rendering them cheap to the interior consumer, is to keep on the duties and facilitate the carriage with the funds so raised. These, however, may be considered as partial benefits, and not sufficiently general to warrant keeping on the duties. But there is a point of view in which I hope it will appear that the advantages are general, and will be felt throughout every part of the states. It is by reducing the expense of all kinds of carriage, and thus economise to each individual more than he now pays in duty on the foreign articles which he consumes.

FOR EXAMPLE :

Wood, for fuel, is an article of the first necessity ; it cannot bear the expense of transport 20 miles on roads ; at that distance it is shut out from the market, and the price of fuel is consequently raised the amount of the carriage ; were a cord of wood carried 20 miles on roads, it would pay for waggoning at least 3 dollars ; on a canal it would pay 20 cents ; thus, on only one cord of wood, there is an economy of \$2 80,—which economy would pay the duty on 14 pounds of tea, at 20 cents the lb. duty ;

Or 140 pounds of sugar, at 2 cents the lb. duty ;
 Or 56 pounds of coffee, at 5 cents the lb. duty ;
 Or 14 bushels of salt, at 20 cents the bushel duty ;
 Or 56 gallons of molasses, at 5 cents the gallon duty.

I will now suppose a city of 50,000 inhabitants, who for their household and other uses will consume 50 thousand cord a year, on which there would be an economy of 140,000 dollars, a sum in all probability equal to the duties paid by the inhabitants. For the duties divided on the whole of the American people, are but \$2 28 to each individual. Here I have estimated each person to pay \$2 80, yet this estimate is made on one cord of wood to each inhabitant of a city ; were I to calculate the economy on the carriage of building timber, lime, sand, bricks, stone, iron, flour, corn, provisions and materials of all kinds which enter or go out of a city, it would be five times this sum ; and thus the towns and cities are to be benefited. The farmer or miller who lives 20 miles from a market, pays at least 22 cents to wagon a barrel of flour that distance ; by the canal it would cost 2 cents ; the economy would be 20 cents ; at 100 miles the economy would be 100 cents, and at 150 miles it would be 150 cents ; beyond this distance flour cannot come to market by roads ; yet at this distance the economy of 150 cents on the carriage of one barrel of flour would pay the duty on

7 1-2 pounds of tea ;
 Or 75 pounds of sugar ;
 Or 30 pounds of coffee ;
 Or 7 1-2 bushels of salt ;
 Or 30 gallons of molasses.

Thus it is, that the benefits arising from a good system of canals, are general and mutual. Therefore should peace and the reduction of the national debt, give an overflowing treasury, I hope you, and the majority of Americans, will think with me, that the duties should not be taken off nor diminished ; for such an act, instead of relieving the people, would really oppress them, by destroying the

means of reducing the expense of transport, and of opening to them a cheap mode of arriving at good markets.

To proceed with these demonstrations, let us look at the rich productions of our interior country :

Wheat, flour, oats, barley, beans, grain, and pulse of all kinds ;

Cyder, apples, and fruits of all kinds ;

Salt, salted beef, pork and other meats ;*

Hides, tallow, beeswax ;

Cast and forged iron ;

Pot and pearl ashes, tanners' bark ;

Tar, pitch, rosin and turpentine ;

Hemp, flax and wool ;

Plaister of paris, so necessary to our agriculture ;

Coals, and potters' earth for our manufactures ;

Marble, lime and timber for our buildings.

All these articles are of the first necessity, but few of them can bear the expense of 5 dollars the hundred weight to be transported 300 miles on roads. Yet on canals they would cost in boating only 15 cents the 100 weight for that distance.

There is another great advantage to individuals and the nation arising from canals, which roads can never give. It is that when a canal runs through a long line of mountainous country, such as the greater part of the interior of America, all the ground below for half a mile or more may be watered and converted into meadow and other profitable culture.

How much these conveniences of irrigation will add to the produce of agriculture and the beauties of nature, I leave to experienced farmers and agricultural societies to calculate.

In Italy and Spain it is the practice to sell water out of the canals, for watering meadows and other

* Animals are now driven to market 300 or more miles, at a considerable expense and loss of flesh, for two principal reasons : first, the expense of transporting the salt to the interior ; and second, the expense of carrying the salted meats to market.

lands. In such cases tubes are put into the canal, under the pressure of a certain head of water, and suffered to run a given time for a fixed price; the monies thus gained add much to the emoluments of the canal companies.

But with all these immense advantages which canals give, it may be a question with many individuals, whether they can be constructed in great leading lines from our sea coast and navigable rivers, to the frontiers of the several states, or pass our mountains and penetrate to the remote parts of our interior country. Should doubts arise on this part of the plan, I beg leave to assure you that there is no difficulty in carrying canals over our highest mountains, and even where nature has denied us water. For water is always to be found in the valleys, and the canal can be constructed to the foot of the mountain, carrying the water to that situation. Should there be no water on the mountain or its sides, there will be wood or coals; either or both of which can be brought cheap to the works by means of the canal. Then with steam engines the upper ponds of canal can be filled from the lower levels, and with the engines the boats can on inclined planes be drawn from the lower to the upper canal. For this mode of operating it is necessary to have small boats of six tons each. As the steam engines are to draw up and let down the boats on inclined planes, no water is drawn from the upper level of canal as when locks are used. Consequently when the upper ponds have been once filled, it is only necessary that the engine should supply leakage and evaporation. There is another mode of supplying the leakage and evaporation of the higher levels: On the tops and sides of mountains there are hollows or ravines which can be banked at the lower extremity, thus forming a reservoir to catch the rain or melted snow. From such reservoirs the ponds of canal can be replenished in the dry months of summer. This mode of reserving water is in practice in England for canals, and in Spain for irrigation. In this man-

ner I will suppose it necessary to pass a mountain 800 feet high; then four inclined planes each of 200 feet rise, would gain the summit, and four would descend on the other side.—Total 8 inclined planes and 8 steam engines. Each steam engine of 12 horse power would cost about ten thousand dollars, in all 80,000 dollars; each would burn about 12 bushels of coal in 12 hours, or 96 bushels for the 8 engines for one day's work.

The coals in such situations may be estimated at
12 cents a bushel, or - - - \$ 11 52

At each engine and inclined plane there
must be 5 men—total 40 men, at one dol-
lar each, - - - 40

Total \$ 51 52

For this sum they could pass 500 tons in one day over the 8 inclined planes, which for each ton is only - - - 10 cents,

Suppose the mountain to be 20 miles
wide, boating for each ton would cost 20 do.

Total 30 cents

a ton for passing over the mountain, which will be more or less according to circumstances. These calculations being only intended to remove any doubts which may arise on the practicability of passing our mountains—

Having thus in some degree considered the advantages which canals will produce in point of wealth to individuals and the nation, I will now consider their importance to the union and their political consequences.

First, their effect on raising the value of the public lands, and thereby augmenting the revenue.

In all cases where canals shall pass through the lands of the United States, and open a cheap communication to a good market, such lands will rise in value for 20 miles on each side of the canal. The far-

mer who will reside 20 miles from the canal can in one day carry a load of produce to its borders. And were the lands 600 miles from one of our seaport towns his barrel of flour, in weight 200 lb. could be carried that distance for 60 cents, the price which is now paid to carry a barrel 50 miles on the Lancaster turnpike. Consequently, as relates to cheapness of carriage, and easy access to market, the new lands which lie 600 miles from the sea ports, would be of equal value with lands of equal fertility which are 50 miles from the sea ports. But not to insist on their being of so great value until population is as great, it is evident that they must rise in value in a 3 or 4 fold degree, every lineal mile of canal would accommodate 25,600 acres. The lands sold by the United States in 1806, averaged about 2 dollars an acre, and certainly every acre accommodated with a canal, would produce 6 dollars; thus only 20 miles of canal each year, running through national lands, would raise the value of 512,000 acres at least 4 dollars an acre, giving 2,048,000 dollars to the treasury, a sum sufficient to make 136 miles of canal. Had an individual such a property, and funds to construct canals to its centre, he certainly would do it for his own interest. The nation has the property, and the nation possesses ample funds for such undertakings.

Second, on their effect in cementing the union, and extending the principles of confederated republican government. Numerous have been the speculations on the duration of our union, and intrigues have been practised to sever the western from the eastern states. The opinion endeavored to be inculcated, was, that the inhabitants beyond the mountains were cut off from the market of the Atlantic states; that consequently they had a separate interest, and should use their resources to open a communication to a market of their own; that remote from the seat of government they could not enjoy their portion of advantages arising from the union, and that sooner or later they must separate and govern for themselves.

Others by drawing their examples from European governments, and the monarchies which have grown out of the feudal habits of nations of warriors, whose minds were bent to the absolute power of the few, and the servile obedience of the many, have conceived these states of too great an extent to continue united under a republican form of government, and that the time is not distant when they will divide into little kingdoms, retrograding from common sense to ignorance, adopting all the follies and barbarities which are every day practised in the kingdoms and petty states of Europe. But those who have reasoned in this way, have not reflected that men are the creatures of habit, and that their habits as well as their interests may be so combined, as to make it impossible to separate them without falling back into a state of barbarism. Although in ancient times some specks of civilization have been effaced by hordes of uncultivated men, yet it is remarkable that since the invention of printing and general diffusion of knowledge, no nation has retrograded in science or improvements; nor is it reasonable to suppose that the Americans, who have as much, if not more information in general, than any other people, will ever abandon an advantage which they have once gained. England, which at one time was seven petty kingdoms, has by habit long been united into one. Scotland by succession became united to England, and is now bound to her by habit, by turnpike roads, canals and reciprocal interests. In like manner all the counties of England, or departments of France, are bound to each other; and when the United States shall be bound together by canals, by cheap and easy access to market in all directions, by a sense of mutual interests arising from mutual intercourse and mingled commerce; it will be no more possible to split them into independent and separate governments, each lining its frontiers with fortifications and troops, to shackle their own exports and imports to and from the neighboring states; than it is now

possible for the government of England to divide and form again into seven kingdoms.

But it is necessary to bind the states together by the people's interests, one of which is to enable every man to sell the produce of his labor at the best market and purchase at the cheapest. This accords with the idea of Hume, "that the government of a wise people would be little more than a system of civil police; for the best interest of man is industry and a free exchange of the produce of his labor for the things which he may require."

On this humane principle, what stronger bonds of union can be invented than those which enable each individual to transport the produce of his industry 12,00 miles for 60 cents the hundred weight? Here then is a certain method of securing the union of the states, and of rendering it as lasting as the continent we inhabit.

It is now eleven years that I have had this plan in contemplation for the good of our country. At the conclusion of my work on small canals, there is a letter to Thos. Mifflin, then governor of the state of Pennsylvania, on a system of canals for America. In it I contemplated the time when "*canals should pass through every vale, wind round each hill and bind the whole country together in the bonds of social intercourse;*" and I am now happy to find that through the good management of a wise administration, a period has arrived when an overflowing treasury exhibits abundant resources, and points the mind to works of such immense importance.

Hoping speedily to see them become favorite objects with the whole American people,

I have the honor to be

Your most obedient,

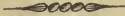
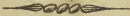
ROBERT FULTON.

TO ALBERT GALLATIN, Esq.
Secretary of the Treasury.

Washington, Dec. 8, 1807.



LETTERS,
ADDRESSED TO THE
PEOPLE OF PENNSYLVANIA
RESPECTING
THE INTERNAL IMPROVEMENT,
OF THE
COMMONWEALTH;
BY MEANS OF
ROADS AND CANALS.


BY WILLIAM J. DUANE.


PHILADELPHIA:

PRINTED BY JANE AITKEN, No. 71,
NORTH THIRD STREET.

.....
1811.

NOTE.

ALTHOUGH I could not but be gratified, by the opinion, which several intelligent individuals expressed to me, that the letters, signed "Franklin," which I communicated for insertion in the "Aurora," might produce some public advantage, if circulated in a pamphlet; yet I could not persuade myself, to procure such a publication, because I did not consider the merit of the letters to be such, as to secure a sale, to the amount even of the mere expense of printing. A number of public spirited persons, however, having defrayed the expense of an edition chiefly for gratuitous circulation, I have cheerfully aided, in revising the succeeding pages, from the same motive, which induced me to write them—the desire to be useful.

It is very probable, that I never should have written a page on such a subject, if I had not acted as chairman, of the committee on roads and internal navigation, during the session, of the legislature, of 1809-10: that situation made it my duty to seek for information, and also enabled me to ascertain some of the causes of the backwardness of Pennsylvania, in undertaking works for internal improvements. Having some leisure, I communicated the result of my inquiries in the succeeding letters; for the imperfections of which, I can offer no other apologies, than, that the subject was altogether new to me, a few months before I began to write, and that the means of information, at the command of any individual whatever, are much more limited than is generally supposed.

W J. D.

December 1810.

LETTER I.

FELLOW CITIZENS,

THE events and incidents, which are every day occurring, at home and abroad, are too generally regarded by you as mere matters of curiosity; you do not receive them, as they really ought to be received, as so many admonitions to you, to attend seriously to your own internal concerns. It is with the hope of attracting your attention to this most interesting of all subjects, at the present moment, that I propose to offer you my sentiments in a plain and familiar style, upon these several points:

1. Your own conduct and the conduct of your representatives, with respect to internal improvements.
2. Why you ought now to be particularly attentive to your internal concerns.
3. The adequacy of the resources of the commonwealth to internal improvements.
4. What internal improvements deserve immediate attention.
5. What other states are doing.
6. The consequences of our activity or indolence.

On the first point. One of the most valuable rights, which, as individuals, we enjoy, under the spirit and letter of our constitution, is that of fully expressing our opinions respecting men and measures. To exercise this right should not be the mere effect of inclination, we should be bound in duty to exercise it whenever any of us honestly thinks that the public welfare requires it.

No doubt, it is under this impression that so many, every day, complain to you of your agents, and it as certainly is under this impression that I am now about to complain to you—against yourselves.

If I were to say, that you have, individually, betrayed a disregard for the best interests of the commonwealth, I should un-

doubtedly do many of you great injustice; but may I not say that you have, collectively, been negligent in the performance of those duties, upon the faithful exercise of which so much of our public and private prosperity depends?

This, I think, I can aver, without giving offence, and I will endeavor to shew you, that, in thus expressing myself, I simply speak the truth.

Our governments are established for the happiness of the whole people, and that this end may be attained, it is wisely decreed that the whole people shall regulate their government, and decide how their happiness can and shall be supported. If, therefore, your government does not answer the purposes of its formation, it is because you, who are constitutionally bound to keep it in life and vigor, do not perform your duties.

It is for this neglect of your duty that I am now about to accuse you. You have every year the power to correct abuses, you have your representatives always within convenient control; you, therefore, are chargeable with the sins of omission or mal-practice committed by those representatives, it is your fault, and to your shame, if they are incapable or indolent.

If your representatives were chosen for four, six, or nine years, I might well excuse you, attach all my censure to them, and wish the time of service were abridged; but as your representatives in the lower house of assembly, serve but for three or four months, and then return into the midst of you, and as your senators are very frequently within control, there is no excuse for you. If your representatives are not fit to perform, or if they do not perform the duties required of them by the spirit of our institutions, the letter of our laws, and the existing circumstances of our commonwealth—the fault is yours, and unless you interfere, it is in vain to expect reform from them.

What are the duties of a representative? Our state constitution gives us the power as well as the right to regulate our own internal affairs, and we choose representatives to perform this duty. Our delegates, therefore, are bound to promote by all possible means the welfare of their constituents; and how is this welfare to be promoted? the means, by which, at all times, the happiness of communities has been promoted, are all within our reach; our representatives have it in their power, by rewards and

bounties to stimulate the genius and industry of the citizen; they have the ability to introduce the improvements, which men of experience and enlightened minds, are every day announcing, in agriculture, arts, manufactures and science; they have it in their power to borrow, from the institutions, not only of our sister states, but even of European nations, fit models for our imitation; they may improve the minds of those advanced in life, and give the rising youth, of both sexes, the foundation of knowledge, love of country, virtue and industry; they can so direct the energies and resources of this commonwealth, as to make our citizens on the Delaware and Susquehanna, intimately acquainted with their brethren on the Allegheny and Ohio; and they may make the capital of the east and the resources of the west mutually aid each other.

Could there be a finer field for the exercise of every virtue and talent, than is thus opened to your representatives? could any man desire an opportunity more inviting, than there is thus held out, for raising an honorable reputation among his fellow citizens, by promoting their essential interests?

Yet with all these means and inducements for virtuous actions, *what has been done?* You have had twenty-seven years of uninterrupted peace, yet there has scarcely been any improvement in this commonwealth, for which you can say you are indebted to the intelligence or liberality of your state legislature. The little that has been done, was executed with so bad a grace as to rob the act of all the merit of free will; many of your representatives would even now, if they could, destroy what has been done; and it is notorious that individuals, proposing internal improvements, have been so often accused of the most unworthy motives or met by the most bitter taunts, as to render it a most unpleasant task for any man to urge your representatives to do their duty.

Yes, I ask, when you reflect upon what might have been done, why is it that there is not a system of general education? why has not the injunction of the constitution, that the poor shall be taught gratis, which your representatives all swear to obey, been executed? why are our principal rivers and streams obstructed? why is your timber, to the amount of millions, rotting or burnt instead of being brought to a ready market? why are two-thirds of your lands in a state of wilderness? why do the people of the

cast, west, north and south, think their interests at variance? why is it, that there is not a canal in Pennsylvania, which of all the states requires canals most? why has not the state held out encouragement to the farmer, manufacturer and mechanic? why have our skilful and ingenious citizens been compelled to seek paltry capitals from private individuals, to enable them to explore and work our mines, improve our mill-seats, and enrich the state by employing its immense internal resources? Why, in fine, is it that Pennsylvania, with a greater white population than any of her sister states, and with abilities equal to any of them, is surpassed by several of them in internal improvements.

Shall I answer for you? Because *you* have been careless in the choice of representatives.

If you have not amongst you men, that are fit to be the law-givers of a great commonwealth, you are in a deplorable condition indeed; but I flatter myself, that this is not the case; I am induced to think that the fault is entirely yours, and that you heedlessly nominate and elect representatives without satisfactorily ascertaining that they are fit to be *legislators*.

These truths I tell you, without any regard or reference whatever to parties; they apply perhaps, with equal force, to republicans and federalists, for amongst both it is too often the case that candidates are selected more for their political than for their general merits. Not that I, by any means, condemn an honest zeal for those persons, on whose political principles and firmness you can most rely; I merely condemn your indifference about that intelligence and that capacity, without which representatives can render but little service either political or municipal.

August 13th, 1810.

LETTER II.

I HAVE said that, owing to your carelessness in choosing representatives, the legislature of this state has accomplished but very few of the objects of its institution; its laws resemble the petty acts of a borough corporation, and bear no marks of an enlightened regard for the interests of so great a commonwealth. This negligence did not produce such striking effects as its

continuation must now do, because the whole of our population has hitherto been almost entirely involved directly or indirectly in a widely extended foreign commerce; now, however, that we have little or no foreign trade, the legislator must support the husbandman and manufacturer, and must endeavor to equalize their dependence upon each other, or else we shall deplorably feel the consequences of a loss of foreign intercourse. In a subsequent letter I will enlarge upon this point.

Some years ago, we were accustomed to boast of our advancement in internal improvements, and felt delighted at being ranked at home and abroad as the first among the states. But can we, at this day, claim this proud pre-eminence? We may indeed safely own, that, comparing our relative situation with that of the eastern states, we equal them in the usefulness and extent of our manufactures, of leather, woollen, linen, and cotton cloths, iron, steel, and silver; and perhaps excel our immediate neighbors: but we must also confess, that, we are excelled by them all in public enterprize, and in those great objects of internal improvement, upon which will ultimately depend the relative value of lands and manufactures.

In the eastern as well as in our neighboring states, the value and even necessity of turnpike roads is no longer disputed; experience has dissipated prejudices which prevailed against them, and public bounty is in those states as ready as private enterprize to promote their extension: but in our legislature, there not only prevails an indisposition to aid turnpike roads by state funds, but to allow their formation even by corporate companies. Instead of legislating upon a large and liberal scale, calculated to do service and honor to this commonwealth, many of your representatives speak and vote as if they represented no more than their own families, or at furthest the particular counties they inhabit. Some of them call themselves exclusive friends of economy, and pretend that their popularity depends upon voting against improving the state! others have the hardihood to say that you are more benefited by having a paltry interest from the bank, than if your money was invested in stocks for roads or canals: they are so ignorant as not to know, that money invested in bank stock is waste in comparison with its employment, in enabling you to carry your produce and manufactures to

every market, and in raising the value of your woods as well as of your cleared lands.

Several instances, of such incapacity and shallow policy, came so directly under my own observation, last winter, that I will mention some of them in detail, to shew you how necessary a change of men will be, if you desire a change of measures.

An application was made to the legislature, for a sum of money to aid in improving the road from Pennsborough to the mouth of Tawanda creek: the importance of this road will be conceived, when I mention that it is the road chiefly used by persons travelling to and from Tioga Point, and by which salt can be most safely conveyed to the central counties of the commonwealth; in the winter of 1808-9, great quantities of salt, were brought from the state of New-York, by this road, and sold at one dollar, to one dollar twenty-five cents per bushel of fifty-six to sixty pounds. Your wise representatives, however, refused any aid whatever.

There had been some trifling appropriations made prior to the last session, for opening the east and west road.* With these and private funds, it had been opened to a very considerable extent, but further aid was necessary to complete it. Application was made, either for a grant from the treasury, or for the proceeds of a tax to be levied upon the lands in the counties, through which the road to be opened was to pass: both were refused, so that the money already expended has been productive of little or no benefit, and some parts of the road that were opened are again covered with underwood and impassable. Yet this is one of the most important roads contemplated in this commonwealth, as you may find on inspection of the state map, on which it is laid down; its course is from the Cocheton turnpike, through all the northern counties, to the west line of the state; it is one of the shortest and best routes of communication between the eastern and western states, and might be made an important means of intercourse between this state and all the country bordering on lakes Erie and Ontario.

* Since I wrote this letter, I have learned with great pleasure, that private exertions have in some degree completed, what the legislature was in vain asked to perform.

An application was made, to induce the state to subscribe for a part of the stock of the companies to be incorporated for making a turnpike road from Perkiomen bridge to Reading, and another from Sunbury to Aaronsburgh. All the circumstances, connected with these contemplated roads, the chain of connection, the populous country to be passed through, and facility of formation, rendered the receipt of common interest for the stock to be taken, highly probable; but even if no such expectation could be entertained for several years, if but two or three per cent, could be realized for the first six years, the stock would have certainly become valuable after that time; wise men, however, would not have calculated in this way, they would have computed the immense benefits, in settlement and cultivation, and in saving time and labor, which such improvements would produce. But your representatives, who think themselves as wise as any representatives on earth, refused to invest any money in this stock, because they could not at once realize as much money as by dabbling in bank stocks.

Applications have been repeatedly made for aid to enable the company, specially incorporated for the purpose, to open the contemplated canal between the Susquehanna and Schuylkill; but hitherto your representatives have rejected all the propositions made by the company, they disapprove of the modes of relief recommended, and yet will not propose any one themselves. At the last session, one of your *wisest* representatives, by repute, declared that it would be impossible to make that canal, although every man of sense and reading knows that undertakings, much more difficult, have been completed not only in Europe but in our own country.

The same impolitic contempt for the true sources of happiness, has characterised the proceedings of the legislature with respect to manufactures: an intelligent gentleman, writing to me on the subject, says, "I am grieved and mortified to think how lamentably deficient our legislature is, respecting domestic manufactures, sheep, &c. and how careless they are about agricultural knowlege; they refused last year to give one thousand dollars to the premium society, and would not purchase some copies of the memoirs of the agricultural society of Philadelphia, to be distributed for public information—yet they voted one

thousand dollars to print the laws in German, which I have no doubt are at this moment useless lumber in some of the offices at Lancaster."

When you reflect upon such instances as these, which are but a few of those within my knowlege, you cannot be surprised, that hundreds of our farmers and manufacturers are emigrating to the western states, every spring and fall; that you cannot get your produce to market at as cheap a rate as your neighbors can get theirs; that your lands do not bear so high a price or become so soon as well settled as those of New-York or Ohio; that your woods are burnt instead of being sold; that your own capital, Philadelphia, has been surpassed by New-York, and is now successfully rivalled by Baltimore; nor can you be astonished that so large a portion of our population and even some members of your legislature are destitute of the manners and acquirements of a well regulated society.

There is no remedy for this shameful state of stagnation, in which we are placed, unless you will undertake to apply one: it is not only your own happiness and honor, that are at stake, but the welfare of your posterity. There are many, who will not fail to attribute the defective legislation, which I have mentioned, to your form of government; they will hold up your indifference in order to deride our representative democracy; and whatever you may think, there are also many whose doubts about free government will be strengthened, if you persist in the selection of men totally unfit to be burgomasters much less legislators for a commonwealth.

August 15th, 1810.

LETTER III.

ON the second point—In my two first letters to you, my friends, I endeavored to shew, that you have been culpably neglectful in your choice of representatives, and that public duty as well as private interest ought to make you more circumspect in future.

It is my purpose to explain in the present letter, why you ought at this time particularly to be well represented, and why

our own internal concerns ought to be strictly and effectually attended to.

It is an axiom amongst writers upon political economy, that the causes, which produce wealth and power in a state, are either those which arise from or belong to the state itself, or those which are extraneous or incidental. We have been so fortunate in America as to be possessed of both those sources of wealth; it is to their united existence heretofore that we must attribute the astonishing progress of our country to a first rank amongst nations.

We have had these advantages in ourselves, a new country, priority of settlement, local situation, and a climate neither too warm and therefore not creating indolence, nor too cold and therefore not rendering the faculties torpid: we have had an industrious and inventive people, a diversity of soil and great internal resources; and, though last, not least important, we have had institutions or forms of government, encouraging industry, and not such as in Europe degrade and impoverish mankind.

And, we have had, as incidental circumstances; 1st, the capital, skill and industry of large numbers of emigrants driven, by war, taxes and oppression from Europe;—2dly, an immense trade in foreign productions, under our neutral flag, owing to the universality of warfare amongst European states; and 3dly, an equally great demand for our own produce; in consequence of the cessation of intercourse between states, who could furnish such produce to each other, and also in consequence of the diminution of productive labor owing to the consumption of men in armies and in battle.

Under such natural and artificial advantages, we have thriven at a rate unexampled in the annals of mankind; we have thriven perhaps too fast, for lasting happiness; and, therefore, instead of repining at the check that has been put to our prosperity as to wealth, we should rejoice that we have escaped intoxication.

Our career has, I say, been stopped; events have of late occurred, by which we have lost the most important of the incidental causes of wealth—an unbounded commerce. The present, therefore, is the time for your legislators to act.

The policy of the belligerents,* either solely directed to the distress of each other, or to that and our depression also, has deprived us of any carrying trade whatever, except in our own produce, or under special licence; and we are besides shut out from nearly all the markets for our own produce, which were formerly the most lucrative.

On the other hand, the maritime and colonial system of Britain, is now so firmly and inflexibly enforced, that we cannot safely trade to any but British ports, in Europe, Asia, or Africa. Whilst, on the other hand, the continental system, established by France is so rigidly enforced, that, even if our vessels should escape British cruizers, their confiscation on the European continent may be anticipated as almost a matter of certainty.

A carrying trade in foreign produce therefore we cannot expect; a market for our own produce is nearly as desperate; and even if all that is anticipated from South America should be realized, the effects will not be propitious in a commercial view to our country; for, the people of South America require very little, if any, of our present produce, and they could furnish many of our present staple articles cheaper than we could.

Many may imagine that the effects, which we now feel, from the several measures of policy pursued by France and England, will not be experienced much longer: but I am of an opposite opinion. England's salvation depends upon her securely holding the monopoly of trade, and she will continue to wage war, since peace would wrest that monopoly from her. France cannot, without efforts and good fortune such as never have been felt by her navy during the present war, accomplish any object by force; her continental system, therefore, will last with the war. So that during the war we cannot calculate with certainty upon a demand in Europe, notwithstanding smuggling and false papers, for above a part of our produce.

* Since the date of this letter, France has unexpectedly changed her policy, but from what causes is very much questioned. It yet remains to be seen, whether this important event will produce any change in favor of American trade: I am of opinion that, the necessity for attention to our internal concerns is not and cannot be diminished by this or by any other occurrence.

November, 1810.

Those, who hold up the flattering prospects of a peace or of the effects of such an event, upon our country, have not, in my judgment, a sound foundation for their hypothesis. It is not fair to anticipate what will be the European continental demand for our produce, at the close of this war, from a calculation of its amount before or during the war. The opening Spanish America, for instance, may mar all these expectations. But there are other reasons, why we should not flatter ourselves with the hope of soon seeing our merchant ships again out number those of any other nation, even as carriers of our own produce.

The current of commerce with American states and colonies being stopped, by the influence of Napoleon's continental system, trade will open for itself a new channel. Indeed this result has already in some measure been witnessed, and all the aid of Napoleon's resources has been given to promote its success, by making all Europe as it were one family, mutually contributing to the wants and conveniences of each other by agriculture, science, arts, manufactures, and internal communications. For instance, much tobacco has within the last four or five years been raised in France and some cotton has also been produced. If, however, these, and other such articles cannot be raised in France, Napoleon's influence will soon obtain a suitable field for the cultivation of tobacco in the Ukraine, and for the cultivation of both cotton and tobacco in Turkey or Greece, if not by favor, by compulsion.

If, in addition to this obvious effect of changing the channel of commerce, we reflect that, when peace shall take place; the European continent will impose heavy commercial restrictions, in order to preserve the new commercial channel or to increase its marine; it will, I think, be considered infatuation to look forward to any such commerce, speculation and profit, as we have hitherto witnessed and obtained.

When, therefore, a suspension of foreign trade and reduction of mercantile profits are not merely expected but actually felt; when there is every reason to believe that there will continue to be, during this war as well as at its close, such a suspension and such a reduction—it is time for us to turn in upon ourselves and inquire whether we cannot, by internal regulations, compen-

sate for the losses necessarily succeeding such events and changes as we have all witnessed.

It is the peculiar business of the legislature to see, that the necessity or demand, which originally called forth inventions, enterprize and capital, shall not cease to operate. If our merchants can no longer make fortunes by foreign trade, they have abundant scope for enterprize at home; if those who have hitherto pursued the arts and trades connected with commerce, cannot now find full employment, our infant manufactories afford them abundant means for exercising their industry; if the demand for our produce has so far diminished as to induce the farmer to make one or more of his sons manufacturers of cotton, wool, flax, iron or leather, he cannot doubt their success: but, much depends upon the legislature, it can, if composed of intelligent men, so manage the resources of our commonwealth as to afford protection to every description of our population, and to make the merchant, farmer, manufacturer and mechanic mutually necessary and beneficial to each other.

At such a time as the present, therefore, when a revolution is really, however imperceptibly, going on; when the very covetousness of our commercial men has thwarted their views and thrown them upon the protection of that country, whose rights and laws too many of them disregarded; when the mad pursuits of foreign trade must be abandoned for internal objects, or must involve those engaged in it in inevitable ruin—it becomes you my fellow citizens, to send to your councils men of sense and information; men, who will take advantage of passing events, by equally encouraging agriculture, science, arts and manufactures; men, who will employ the resources of the state in establishing substantial internal improvements, and whose knowledge will extend beyond the purchase and sale of public stock.

August 16th.

LETTER IV.

In the preceding letters I have complained of your indifference respecting the choice of your representatives, and I have endeavored to convince you, that, at the present crisis, you cannot be too attentive in your selection of men, upon whom it will

depend whether we shall remain in our present state of internal apathy, or rival our neighbors in enterprize and zeal for improvements.

The third point, respecting the resources of the commonwealth, I proceed to notice in the present letter.

In order that you may know the nature and amount of the ordinary expences of your government, and the means by which those expences are defrayed; and in order that you may learn the nature and amount of the deficiency or excess of the income, I lay before you, in the first place, an official statement of the whole of the receipts and expenditures at the treasury, for one year, ending the 30th November, 1809, (during one half of which the embargo was in force.)

RECEIPTS.

	<i>Dolls.</i>	<i>Cts.</i>
For lands, - - -	318,129	49
Dividends and interest on bank stock, -	120,108	15
Auction duties, - - -	33,635	22
Tavern licences, - - -	24,116	47
Exempt fines, - - -	9,346	17
Fees of sec. of Com's. office, - - -	889	07
Debts, - - -	36,626	53
Miscellaneous, - - -	4,414	70
	<hr/>	
	547,265	80

EXPENDITURES.

	<i>Dolls.</i>	<i>Cts.</i>
Expenses of government, - - -	149,282	02
Militia expenses, - - -	11,883	60
Bank stock purchased, - - -	82,544	15
Improvements, - - -	21,075	34
Pennsylvania claimants, - - -	20,202	44
Olmstead's case - - -	15,898	75
Pensions, - - -	3,823	89
Unfunded debt, - - -	2,449	26
Miscellaneous, - - -	4,979	26
	<hr/>	
	312,148	71

These receipts and expenses are divisible into *ordinary* and *extraordinary*; the former comprising those payments and receipts, which are made and are obtained every year as matter of course; the latter comprising those which are contingent or dependent upon varying circumstances.

Of the *receipts* for 1809, as above stated, the 2d, 3d, 4th, 5th, 6th and 8th, are *ordinary*, such as we calculate upon, for each succeeding year,—they amount to the sum of 193,194 dollars and 47 cents. And of those receipts, the 1st and 7th items are *extraordinary*, amounting to 354,756 dollars and 2 cents.

Of the expenses, as above enumerated, the 1st, 2d, and 7th, items form the *ordinary* expenditure, amounting to the sum of 164,989 dollars and 51 cents. And of those expenses all the other items are *extraordinary*, amounting to 147,150 dollars and 54 cents.

Ordinary receipts—193,194 dollars 47 cents—ordinary expense, 164,989 dollars 51 cents.

Leaving an annual balance in the treasury of 28,204 dollars and 96 cents, to be appropriated at the will of the legislature.

This sum alone, if annually devoted to useful purposes, could produce many beneficial effects, but we are not to suppose that the ordinary surplus will be stationary; on the contrary, we may safely calculate upon an annual increase. That is, even if our population and resources should remain as they are, or at least without encouragement, the ordinary income must increase, whilst there is no reason to suppose that the expenses of our government will increase. But should your representatives wisely employ the surplus funds now at their control, the effects must be an improving country, an increasing population, thriving manufactures, and consequently, an annual addition to our resources for further improvement.

We see that we had in 1809, nearly 30,000 dollars surplus for that year alone; the state has since purchased additional stock, as follows:

In the Philadelphia bank, 358 shares at par,	\$35,800
In the Farmers and Mechanics bank at 145 per cent, 208 shares,	15,080
In the Philadelphia bank, 233 shares at 135 1-4 per share,	31,513 25
In the bank of Pennsylvania stock at par.*	250,000
	<hr/>
	332,393 25

The interest upon this sum, therefore will henceforth form an item in the ordinary receipts, and averaging the interest at 8 per cent per annum, the amount of that item will be, 26,592 dollars and 2 cents, which added to the surplus revenue already acquired, will make our ordinary annual income, more than the ordinary expense of government, 54,796 dollars and 97 cents.

Besides this amount of ordinary surplus revenue, there will, from the first of October next, be another source of ordinary income; a law, passed at the last session of the legislature, taxing the offices of prothonotary, recorder, register, &c. throughout the commonwealth, will, in all probability, produce about 20,000 dollars annually.

So that, if we were even to continue in our present state of comparative stagnation, as to population and improvements, there would be at the disposal of the legislature about 75,000 dollars more than we have an ordinary demand for. And I must also mention, that this calculation does not include any interest for the stock in roads, &c. which the state possesses to the amount of above 40,000 dollars—or any receipts on account of state taxes due by many of the counties.

* By this purchase at par, the state realized a profit or bonus of about 110,000 dollars, and is at liberty to realize a like sum by subscribing at par for 250,000 more dollars—making 220,000 dollars, as the price of the renewal of the charter of the Bank of Pennsylvania, for twenty-one years. It will be seen, however, that I have not placed this 110,000 dollars among the resources of the state, although that sum really forms a part of the capital at command; for although if the state were to sell its stock in market, there would be a reduction of its price, that reduction would not be of much consequence, and indeed by good management might probably be prevented.

Even this should be regarded as a flourishing state of our finances; yet encouraging as it is, it is by no means equal to what it might, and no doubt would be, if your affairs were uniformly guided by intelligent men—for I have hitherto only enumerated the *ordinary* resources of the state: whilst the *extraordinary* resources are such, that, if well attended to, there are no improvements, whether by roads or canals, which they would not be adequate to complete. Yes, fellow citizens, I say, that without requiring one cent of tax from you, and even after leaving 75,000 dollars surplus annually in your treasury, your representatives might, by good management of your resources, raise the value of your lands, woods, grain, and all your articles of produce and manufactures, on an average, at least one-third above their present rate. And yet desirable as this must be, you may depend upon it, no such effects will be produced, if you do not send more intelligent men than you have hitherto sent, or if you do not instruct them what they should do.

The *extraordinary* resources, with the proceeds of which, I have said, so much can be accomplished, are of two kinds—*miscellaneous debts* due the state, and *debts due for lands*.

The principal miscellaneous debts are the following—

Balance due in 1809, by the estate of the late John

Nicholson,	-	-	-	\$ 89,519 32
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Due by the United States for monies advanced by this state, in 1794-5, to suppress the western insurrection,	-	-	-	21,804 64
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By Mr. P. Baynton,	-	-	-	20,000 00
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By the trustees of the University of Pennsylvania,	10,000 00
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By the Easton Delaware bridge company,	7,000 00
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By commissioners of Luzerne county,	1,325 00
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By Wm. M'Dermott, loaned him on interest,	3,000 00
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Amounting altogether to	\$ 152,648 96
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It is very true, that there can be no precise calculation made as to the actual sum, which the state will receive on this account but as the amount due by Mr. Nicholson's estate in 1809, was reduced from 107,729 dollars to the above stated sum, and as there is no pretence of set-off against the state except on the part of the university, it may be reasonably supposed that by taking

proper measures the commonwealth may acquire two-thirds of the whole amount of those debts—say 100,000 dollars.

These, however, are much less deserving of notice, either as to their nature or amount, than the debts due for lands; and, that you may the better understand this point, I will now offer an abstract on the subject from the report of the receiver general of the land office:—

OLD PURCHASE.				Number of office rights issued.	Patented.	To patent or ac- counts to settle.	Rate per cent.	Average price per tract.	Dollars.
<i>Warrants.</i>									
From January 1, 1737 to December 1762.	12382	5143	7239	15	10	0	150	1085850	
— January 1, 1763, to August 1765.	777	344	433	9	0	0	40	17320	
— September 1765, to September 1779.	8524	4710	3814	8	6	8	30	114420	
<i>Applications.</i>									
— August 5, 1765, to April 17, 1770.	13606	3803	9803	8	6	8	180	1764540	
<i>Warrants.</i>									
— 1784 to 1792.	16887	9996	6891	10	0	0	20	137820	
— April 2, 1793 to September 23, 1794.	27647	9793	17854	2	10	0	5	89270	
— September 23, 1794 to Nov. 1, 1808.	3856	1419	2437	{	10	0	0	8 19496	
					2	10	0		
									3228716
NEW PURCHASE.									
<i>Warrants.</i>									
From May 17, 1785, to March 1789.	903	523	380	30	0	0	70	26600	
— March 1, 1789, to April 2, 1792.	14	4	10	20	0	0	35	350	
— April 3, 1792, to November 1808.	4631	2524	2107	7	0	0	15	31605	
	5070	3256	1814	5	0	0	20	26280	
Office fees, on 52,782 tracts, at \$ 9 each,	94297	41515	52782	-	-	-	-	475038	
Amount, Dollars,									3798586

From this estimate, and from the report of the committee of ways and means, made in March 1809, to the house of representatives, it appears that there were from the year 1737 to Nov. 1808, 94,297 warrants and applications for lands; that of these, 41,515 had been patented or the accounts settled, that 52,782 tracts remain to be paid for; and that, if the whole were patented upon the principles of the above estimate, the sum paid into the treasury would amount to *three millions, seven hundred and ninety-eight thousand five hundred and eighty-nine dollars.*

Many of you will ask, with astonishment, why those debts have so long remained uncollected, and truly you may well do so, for there has not been either policy or justice in permitting

these accounts to remain unsettled. It has been *impolitic*, because the inattention of government for so many years, has put all idea of payment without some kind of compulsion, out of the minds of most of the debtors; because the use of this money hitherto has been lost to the state; because the interest paid by the debtors has not exceeded on an average one per cent, upon the sum due; and because this indulgence has slackened and not stimulated industry. It has been *unjust*, because those who paid for their lands in the first instance, paid the principal then and of course the interest ever since; that is, A. who paid 100 dollars in 1780, enabled the state to raise at least six dollars each year upon that sum from that time to the present, amounting to 180 dollars more, whilst B. who bought in 1780, to the amount of 100 dollars on credit, has received equal to 180 dollars by the state's indulgence. It has been unjust, because the people of Philadelphia and the people of the western counties, who paid well, have therefore not only maintained the state government, but contributed to the improving of the very counties which have been defaulters.

The people, who owe, have not even the excuse of inability to pay; the counties most delinquent are those most wealthy, Chester, Lancaster, York, Dauphin and Berks; many who owed in 1808, and who intended to pay if the legislature had exacted compound interest, as soon as they found that merely the old interest would be exacted, returned to their farms, openly avowing that, as they had but one or two per cent to pay to the state, it would be best for them to invest their money in some stock, and make four or five per cent clear.

But, when, in 1809, the legislature determined to exact payment either of principal or compound interest, there was paid into the treasury in the month of August alone, the sum of 220,607 dollars and 22 cents, and there is no doubt but that the whole sum due, amounting to nearly *four millions of dollars*, would be thus gradually paid, if the legislature did their duty to the state at large. Instead of that, however, they repealed at the last session, the law which had brought such large sums, and which would have continued to bring such sums, into the treasury, and granted further indulgence until November, 1811.

I have been thus particular on this point as well to prove the extent of our resources, as to induce you to select men who will bring them into actual operation.

On the subject generally—1st. I have shewn that without resorting to loans or taxes, we can support our state government upon our ordinary income: 2dly. That we can not only do that, but place a surplus revenue of 75,000 dollars annually in our treasury, for internal improvement, &c. 3dly. That we possess extraordinary resources, that is, as it is in reality, money lent out during the last 90 years to individuals, now able to return it, to the amount of about four millions of dollars.

What intelligent legislators may accomplish with such resources, you may readily determine, as well from your own knowlege, as from the legislative experience of your members: such, however, has been the apathy or unfitness of those who have been at the head of affairs, that the appropriations, or rather payments, made by this state during the last eight or nine years for internal improvements, do not exceed the surplus revenue for one year from an ordinary income!

August 17th.

LETTER V.

IN the last letter, that I addressed to you, I pointed out the ordinary and extraordinary resources of the state; the former consisting of the sum of 75,000 dollars, annually brought into and remaining in the treasury, over and above the expences of our government; the latter consisting of good debts, due to the state, amounting to about four millions of dollars.

As there could not, in all probability, be more than 300,000 dollars advantageously expended, in each year, upon internal improvements, and as the receipt of that sum annually may be calculated upon, I might stop here and decline saying more respecting our resources. Some benefit, however, may arise, from a further discussion of this point.

Persons accustomed to other governments will perhaps smile at my calling good debts, which are in part annually paid off, *extraordinary* resources: I have used the term to shew our ability to improve the state, by these as well as by ordinary means, and

not because I am not aware that there are other extraordinary resources within our control. I will now endeavor to shew, that if we had not either of the resources mentioned in my last letter, there are others, to which we might with confidence and propriety resort. We might raise a fund, 1st. by *taxation*—2dly. by *lotteries*—or 3dly. we might command the use of private wealth by incorporating and properly encouraging companies.

With respect to taxes. I consider these positions as indisputably correct: 1st. The object of government is to diffuse the greatest possible happiness amongst the whole people: 2nd. The people cannot be happy without civilization: 3d. The best means to promote civilization are to unite men as much as possible in societies, and to make them mutually support, and depend upon each other: 4th. To be happy it is not only necessary that a man should raise as much corn and make as much cloth as would support and clothe himself and family, he must have a *surplus* to exchange for certain conveniences which he cannot by his own labour procure, and for giving education to his children: 5th. The greater this surplus to a certain extent the more capable the man is of promoting his own happiness and that of others: 6th. It is the business of government so to manage the affairs of the state as to facilitate the means of the citizen for making this surplus: 7th. This cannot, under our present circumstances, be in any manner so effectually accomplished as by forming good roads, canals and bridges, and the more these are extended the less we resemble the Indians on our frontiers, the nearer we approach the object of our creation.

If these positions are admitted, it follows, that as internal improvements promote the moral and political happiness of the people, and as the people themselves are the source of power, it is their duty and business to defray the expences of those improvements. Yet your representatives in the legislature shudder at the bare mention of taxes, as if in laying them they had interests distinct from yours, as if they imagined you would suspect them of a desire to put your money in their own pockets and not in the treasury for your benefit. Whence does this dread arise? Are you unwilling to contribute? say, one dollar each per year, for the promotion of objects, which, if completed, would raise the value of your lands, woods and produce one-third at least,

above their present rate? I cannot suppose that this is the case, I am more inclined to think that many of your representatives gain your confidence by profession of economy, and that mistaking your character, they shudder at the name of a tax, as if it were synonymous with waste of money; I am of opinion, in short, that many of your representatives have but one object, to keep their places, and that they would look on with composure at your retrograding to barbarism rather than risque the loss of their winter quarters by proposing adequate means to stop you in your retrocession, or to enable you to advance to the utmost heights of civilization and happiness.

It is the use, that is to be made of the proceeds of a tax, which is alone worthy of your consideration; if there is not employment for money, it will not be asked; or if asked you will not give it; but, if there is an imperious necessity for funds, to enable your representatives to carry into effect those measures upon which your welfare depends, those funds may be freely asked, and no doubt will be as freely given.

I am of opinion, therefore, that taxation is a resource, if we had no others, upon which the state might rely for the accomplishment of objects of internal improvement.

With respect to lotteries. If your representatives will faithfully employ the funds within their control, or will lay a tax for internal improvements, either of these will be a mode preferable to lotteries; but if your representatives are determined to let your money lie in the banks, comparatively, at an absolute loss, and are afraid to ask you for one dollar each per annum. I can see no just objection to the accomplishment of internal improvements by lottery profits.

Your representatives do nothing, and yet they contrive to make their want of intelligence or enterprize appear the result of a zeal for your interests. If you ask them why the money in bank is not laid out upon canals, they answer "O! if we were to do that, we should have to tax the people to support government." If they are asked why they do not ask the people to contribute towards improvement, they say "the people don't like to part with their money." And if they are asked to raise money by lottery, they say "lotteries are gambling."

I repeat, if they will do any thing else, they need not resort to a lottery; but, as they will do nothing else, I ask, is the reason for rejecting lotteries sufficient? There can be no dispute about the nature of a lottery, it is a game of chance, and if it produces the pernicious effects of gambling it certainly ought not to be resorted to—do lotteries produce these effects, is the question? We may conclude that they do not, in the first place because European states as well as our own have resorted to them, they have been the means whereby great internal improvements have been made in New-York and our own legislature has authorised them for raising funds for education, &c. This, I say, is an evidence, that they do not produce the usual consequences of gaming, for it is not to be supposed that states would voluntarily sanction a pernicious institution. In the next place, we can judge from our personal experience—tickets in lotteries are almost universally purchased singly by individuals, at a small rate, the sum invested and the uncertainty of prize are so trifling that it seldom happens that an adventurer gives himself any concern until the close of the drawing; gaming of any other kind leads individuals into every species of excess and idleness, but I know no instance in which the mere possession of a ticket has had any such consequence. If therefore, the means, by which a desirable and happy end may be accomplished do not make men immoral, and we have no evidence of any immorality succeeding any of the numerous lotteries allowed by law, I think the state may with propriety pursue the example of New-York in particular, which has raised above half a million of dollars for internal improvements, without any pernicious effects. I am prepared to admit that many of the petty lotteries established by our own state have been injudiciously or fraudulently conducted, but this might have been prevented by a wise legislature: these petty lotteries, indeed, cannot be perfectly managed, they are followed by brokerage, &c. and there is no check sufficiently binding. It is, besides, notorious, that although there is a law against the sale of tickets of lotteries authorised by other states, those tickets are every day sold openly in our towns. Evils therefore, may have resulted from the looseness or insufficiency of our laws, and perhaps nothing could so well put a stop to them as an annual and exclusive lottery, carried on for the account of the state, the

profits to be applied solely to internal improvements. If we do not establish such a lottery, it cannot be supposed that we shall therefore stop the sale of lottery tickets; do what we may those tickets will be sold, and it is much better therefore that we should at once have all the profit of lotteries for our own use, and prevent the money of our own state from being carried to New-York and Maryland; by creating a lottery of our own, besides, we may prevent the frauds and impositions to which our citizens buying in lotteries of other states will certainly be exposed.

Yet, let me again say, that, although I consider this a resource to which the state may apply, without detriment to the public's morals or interests, I would prefer any other, and as we have others they may be resorted to. My wish is, that something worthy of the state may be done; how it should be done, you or your delegates are to decide; I have shewn that there are various roads by which we may reach the desired object.

Of corporate companies.—After having objected to every other mode for improving the state, it is not surprising that your representatives should oppose resorting to corporate companies. As in all other cases, they pretend in this also, that they oppose corporations from pure regard for the people: “these companies,” say they, “are daily increasing in number, they have interests distinct from those of the people, and will by-and-bye, join and rule the state.” Such objections as these would certainly command more of my attention than they do, if they were urged by men, in the habit of substantially promoting the real happiness of the state: if, for instance, one of your representatives were to say, “canals are absolutely necessary to our union and to our welfare; we must make them; and, as I do not like corporate bodies, I propose to levy a tax, the proceeds to be annually expended upon public improvements; I propose to sell out our two millions of bank stock, at the rate of 200,000 dollars per annum, so as not to lessen its value in the market; and I propose to collect promptly and faithfully the four millions of dollars honestly due to the state;” if, I say, such language as this were used, I should regard these professions of zeal for the people as sincere, and believe the opposition to corporate companies honest; but when, instead of this, your representatives do nothing, propose nothing, and reject every thing,

I must conclude that they are not governed by an enlightened policy or just sense of their stations and duties.

I know no means whatever, by which canals or roads can be so well or so conveniently made as by the means of companies sufficiently interested in the undertakings. As for works superintended by public agents and paid for out of the treasury, I should never recommend them; "the public" says the proverb, "is a rich master," and therefore it is notorious that the public is never so well served as individuals; the manner in which the state roads in the interior are constructed, is in general scarcely honest and often absolute swindling. It will be for the interest of the state, therefore, to grant acts of incorporation, to become partners in the stocks, to grant liberal terms for a limited number of years, and to provide that the state may at the expiration of this term purchase the whole of the stock held by individuals. By those means, works will be well and cheaply done, the partnership of the state will gain for those companies and stocks the confidence of the public, and the state will at last be able to buy up a valuable stock, and then to exact either low tolls or barely such as may be necessary for repairs. Should some such plan as this be pursued, the phantoms, which prejudice raises up respecting corporate companies, may be dissipated; individuals will form companies for no other purposes than to gain for a number of years a good interest for their money and to raise the value of their lands by promoting internal improvements.

"In all human institutions," says a celebrated writer, (Playfair) "there is much that is bad and something that is good; and the best, as well as the worst, are only combinations of good and evil, differing in the proportions." According to these truths, I may readily admit that corporate bodies may become hurtful, but I contend, that if they should, it will be the fault of the legislature, so numerous and certain are the checks which intelligent legislators may impose, that it would be next to a miracle, were a corporate body or bodies to attempt, much less execute, any scheme prejudicial to the public. Besides, I can by no means admit that the objections, which really apply to European corporations, can justly be urged against those we erect; the church and the bar, for instance, are in England corporations, they have an interest of their own, their charter is unlimited, their abuses

are a part of the government; but, with us, where a number of men lay out their money in opening a road, and obtain by contract the right of toll to give them interest for that money, they do not therefore form an interest separate from that of the people, on the contrary, they are mutually dependant and serviceable.

I cannot, therefore, but heartily condemn the narrow policy and prejudice, which refuse to take advantage of every offer of individuals to contribute to the public comforts and convenience; and I cannot but heartily recommend the encouragement, under proper restrictions, by charters and by the investment of funds, of every association that shall offer to open our rivers and roads. This is an extraordinary resource of very great magnitude, especially at the present moment when capital is chiefly withdrawn from the ocean; if it is not abundantly employed now, it is because your representatives either do not know or do not perform the duties, which the spirit and the letter of our constitution inculcate. Put men of sound sense in your councils, and you will soon have inland seas and inland trade to compensate for the loss of those from which we are driven.*

August 20th.

LETTER VI.

HAVING shewn that we have abundant resources for any improvements which we may choose to make, the next inquiry is, "what improvements deserve immediate attention?" This inquiry embraces two points. 1. The nature of the improvements, whether canals, or roads, or both. 2. The particular places and directions in which such improvements should be made. The first point shall be noticed in the present letter, the second in those which I have yet to lay before you. It may be

* Since the publication of this letter, I have been favored with copies of several very interesting documents, which are highly deserving of attention. I refer to them in this place, as they are in some measure illustrative of the subjects discussed in this letter: they form appendix A. at the close of this pamphlet.

November, 1810.

useful, however, in this place, to meet one objection, which I have often heard urged against the expenditure of state funds for works of magnitude.

It is frequently asked, why does not the union make these improvements? and I might at once reply—because congress is quite as inattentive as the Pennsylvania legislature. The question, however, amounts to an objection, and it is therefore fit that I should shew that it should have no influence.

It is certainly true that improvements in any state will be useful to all the rest, but this, instead of deterring us from activity, ought to stimulate us to enterprize; we are all of one kindred, our prosperity will arouse others to become industrious, and thus we shall be repaid for whatever service we may now render to the other states.

It is also true, that the union possesses immense funds, (lands, which at two dollars an acre, are worth *one thousand millions of dollars*, &c.) a part of which we may justly claim as well as other states, for internal improvements. But are other states waiting for this distribution? Ought we to wait for it? When will it be made? Shall we not lose more by delay than we shall at last obtain from this distribution? These questions are so easily answered, that I need not enlarge upon them. There are arguments, however, in favor of our at once proceeding in improving the state, which I cannot pass over.

The report of the secretary of the treasury and the project of Mr. P. B. Porter, point out.—1. What the union should do; and 2. By what means the work should be done.

1. The works to be done, with their expense, are these:

A tide water inland navigation, for sea vessels to be opened from Massachusetts to North Carolina,	} <i>Dollars.</i> 3,000,000
A turnpike road from Maine to Georgia, Improving to their heads, the four great At- lantic rivers and making canals parallel to them,	} 4,800,000 1,500,000
Turnpike roads from the heads of those four rivers to the corresponding heads of west- ern waters,	} 2,800,000
	<hr/> 12,100,000

Brought forward,	\$ 12,100,000
A canal around the falls of Ohio,	300,000
Improvement of roads to Detroit, St. Louis and New Orleans,	200,000
Inland navigation between the Hudson and Lake Champlain,	800,000
A canal from the Hudson to lake Ontario,	2,200,000
Opening a sloop navigation from lake Onta- rio to lake Michigan,	1,000,000
Local or miscellaneous improvements,	3,400,000
	<hr/>
	\$ 20,000,000

2. Such are the improvements, which the union is asked to commence, and for the completion of which Mr. Gallatin and Mr. Porter have enumerated sufficient resources. "An annual appropriation of two millions," says the former, "would accomplish all those great objects in ten years, and this sum may without inconvenience, be supplied in time of peace, by the existing revenues and resources of the United States."

This is undoubtedly a most flattering statement, and you might perhaps with propriety hesitate to engage in expensive works with state funds, if you could calculate with certainty upon the forwardness, not to mention the completion, of those works, within ten years; but no sort of evidence exists to support such an expectation.

Let us suppose, however, that these works should be commenced; it is, in the first place, probable, that the first appropriation would be applied to the most important works, and these are not directly interesting to Pennsylvania; and in the next place, the works directly interesting to Pennsylvania are not so expensive, as to justify our delaying for the aid of the union.

All that Mr. Gallatin proposes to do within Pennsylvania is, 1st. To improve the Susquehanna and make a canal along its bank to the head nearest a western river. 2d. To make a turn-pike road from that head to the nearest western river. Mr. Porter does not propose to do as much, he appears anxious to get all possible aid in order to make the Hudson the principal route of communication between the Atlantic and the lakes, indeed he proposes no other route. I do not say this as matter of

crimination; I wish Pennsylvania had representatives as attentive to her interests as Mr. Porter is to those of New-York; nor shall I grumble because Mr. Gallatin and Mr. Porter propose to expend three millions of dollars more in New-York than in Pennsylvania, if the former really has such a superior claim; my object is to shew, that, out of the twenty millions of dollars to be expended, but one million one hundred and twenty-five thousand dollars are to be laid out within Pennsylvania—that is for the improvements above mentioned, for the state has already incorporated companies for making a turnpike road along fifty miles of the route from Maine to Georgia.

I do not say that this sum, proposed to be thus expended, is not important, or that we ought not to be anxious to get it; but I do say, that it is too trifling, to justify our waiting for years, until it shall be even appropriated. Some plan may, perhaps, be contrived, for obtaining, hereafter, some reimbursement from the union, but it will be fatal to our interests, if possessing above four millions of our own immediate resources, we keep that money in bank stock, or suffer it to remain in the hands of delinquent creditors—because congress does not choose to do its duty.

There is another consideration, besides, which claims some regard. Mr. Gallatin does not propose, Mr. Porter does not propose, nor does congress intend, to expend those twenty millions as a mere gift; they all contemplate the investment of that money as a stock for the union only, or as a stock in company with the corporate bodies. Two questions then present themselves—1st, Would not the ownership by the union of stock to so large an amount, managed by officers of the United States, be likely to create an improper influence? 2d. Is it likely that the stock, invested in great works, such as the canals, would become valuable? 3d. If the ownership of the stock would create an influence, not contemplated by the constitution or necessary to our welfare; and if the stock would become valuable; both of which effects would in my opinion result; would it not be best that the state should at once commence those works, and thus preserve her interest and her influence? Every man can answer for himself.

For my own part I have not a doubt upon the subject, the state ought on every account to exert itself. We know that ac-

cording to the constitution of the union, the United States cannot open any road or canal without the consent of the state, through which it must pass—the propriety of altering this is very questionable; at all events, the provision shews some apprehension of the influence I have mentioned. If we were a poor people, we might calculate more nicely, but being wealthy, it will be as much to our honor as to our interest to be “up and doing:” other states are not waiting for Hercules to help them, they have their shoulders already to the wheel, and we must put ours to it also, or we shall remain in the mire.

Having thus noticed this excuse for doing nothing for ourselves, and, as I hope, shewn its futility; I proceed to the inquiry, properly the subject of this letter, whether we should make canals or roads, or both? An obvious answer to this is, we cannot make canals every where, nor roads every where, but must regulate ourselves by the nature of the ground or country to be passed through. This is true, yet it is as true that canals may be much more easily constructed, and through a greater variety of country, than is generally supposed: no less than twenty-two canals cross the high lands, which run through the greater part of England. The object I have at present is in reality to shew, that we ought to expend twenty dollars upon a canal for every one we lay out upon a road, and that where either a canal or a road may be opened, we should prefer the former even if its construction should cost twenty times as much as the latter.

When we see countries such as England and France, where the mercantile, manufacturing, and agricultural interests are all encouraged, which have none of the advantages, comparatively speaking, that we possess; when we see those nations devoting the utmost attention to canals, this knowledge alone is sufficient to animate us to imitate them. When we know that those nations, even during a war unexampled for the waste of lives and treasure, have annually devoted a portion of their resources to those purposes, we may easily conceive the immense benefits that result to the state from their accomplishment.

And when such nations do so much, what ought not we to do who have such superior advantages? In the first place, we may make all our improvements without laying one cent of tax upon

the people; whilst the Europeans already groaning under almost intolerable burdens, must bear more in order to make improvements. In the second place, no European nation can supply its wants, from its own resources much less the conveniences or luxuries of life, but there is no necessary or convenience which we cannot produce within our own territory, and therefore internal intercourse is to us of infinitely more moment than to Europeans. In the third place, Europeans are obliged to form, as it were, both bones and muscles, both arteries and veins, but we have already formed to our hands the bones and arteries, and have only to supply the muscles and veins; no nation on earth, even putting out of view the comparative extent of territory, can so easily form internal water communications as we can; there are but ninety-eight miles to be cut through in order to open a tide-water navigation for sea vessels, from Massachusetts to North Carolina, and there are but about fifty miles to be cut through, in order to open a sloop navigation nearly three thousand miles in extent, from the St. Lawrence to the Mississippi, connecting the lakes Ontario, Erie, Chatoqua, Huron, Michigan, and Superior, by means of the rivers Allegheny, Ohio, Cayahoga, Muskingum, Wabash, Miami, and Illinois. Whilst the heads of the rivers running eastward to the Atlantic, in various places, approach so near the heads of the waters running westward to the Ohio and to the lakes, that, if they cannot be easily united by canals, which I think may be done, it is at least certain that they can all be united by turnpike roads at a less sum than has been received in one year by the sale of public lands.

So self-evident is this superiority over Europeans, that no particular arguments seem requisite to induce us to take advantage of the circumstances, in which we are so happily placed by nature.

Of the peculiar benefits of canals, in preference to roads, much may be said; I shall not, however, be very diffuse on the subject. *Canals* are important to the *farmer* and *land-holder*, because they enhance the value of the lands, woods, coals, iron and other mines, to the extent of at least forty miles on each side of the country through which they pass; because they enable the farmer to carry his produce to market, and to return in his boat loaded with goods or manure, at an expense twenty times less than by

roads, and because all that is thus saved is actual profit; they are important to him, besides, in case he should want either to drain his lands or to irrigate them; and they also enable him to employ his horses or oxen entirely upon his farm, and not on the road.

Canals are important to the manufacturers, because they enable them to collect and transport the raw materials and fuel that are wanted; to convey the goods manufactured, at so cheap a rate as to admit their selling their productions at a much cheaper price than similar goods could be imported for.

Canals are important to the miner, because they enable him to convey to market such heavy or bulky articles as would not bear the cost of land transportation.

Canals are important to merchants on the sea coast and in the interior, by affording a certain and cheap conveyance for goods or articles imported by the former, and for the produce returned by the latter; but they are still more important by opening a trade between all parts of our immense continent, which must at no distant day, rival, if not entirely supercede a large foreign trade.

Canals in winter may answer, as in Holland and Flanders, all the purposes of the best constructed roads—they are thus used, in those countries, by means of sleighs, as much as they are by means of boats in summer.

Canals, including the towing path, do not occupy more ground than our turnpike roads; a canal forty feet wide and a mile long would occupy but five acres of ground.

An able English writer upon inland navigation, Mr. John Phillips, makes these impressive remarks.—“All canals may be considered as so many roads of a certain kind, on which *one* horse will draw as much as *thirty* horses on ordinary turnpike roads, or on which *one man* alone will transport as much as *three men* and *eighteen horses* usually do on common roads. The public would be great gainers, were they to lay out upon making every mile of canal twenty-times as much as they expend upon a mile of turnpike road; but a mile of canal is often made at a less expense than a mile of turnpike. Were we to make the supposition of two states, the one having all its cities, towns, and villages upon navigable rivers and canals, having an

easy communication with each other; the other possessing the common conveyance of land carriage; and supposing both states to be equal as to soil, climate and industry; commodities and manufactures in the former state might be furnished thirty per cent cheaper than in the latter? or in other words, the first state would be a third richer and more affluent than the other."

Our own countryman, Mr. Robert Fulton, whose scientific and practical knowledge as an engineer, are only equalled by his patriotic efforts to make it useful to his country, has written largely and ably respecting the superiority of canals. I had intended to have here extracted some calculations from his letter of the 8th December, 1807, accompanying the secretary of the treasury's report to congress, but the whole of that letter is so important, and contains illustrations so much more valuable than I could pretend to furnish, that I conclude to lay it before you as a succeeding one.

The remaining argument in favor of canals is more important, perhaps, than all the rest that have been or can be employed in their favor; *they are essential to our union and freedom*. "They will have a powerful effect," says Mr. Joel Barlow "in assimilating our manners, in inspiring that confidence and friendship, and in creating those mutual interests and dependence, which are so necessary to the political union of men, who feel themselves able at all times to change their connexions at pleasure."

The enemies of our freedom, or those who are jealous of our happiness, predict our ruin from the extent of our country, and the contrariety of the habits of our people; they tell you that a strong government is alone capable of ruling so unwieldy an empire; and even Washington, but from other motives, from his solicitude for your safety, says, that "in a country so extensive as ours, a government of as much vigor as is consistent with the perfect security of liberty, is indispensable." If there are grounds for those invidious predictions on one side, and for these honest apprehensions on the other, what can so readily or effectually remove them as canals, or where these cannot be made, good roads? Those works, if executed to the extent, to which they may be carried in ten years, would, by greatly facilitating the means of intercourse and thus combining its population, as it

were, reduce this immense country to the size of a single state; local interests and prejudices would cease to exist, and we should thus be united by every tie in one common brotherhood.

August 22d.

LETTER VII.

IT may be well to remind you, fellow citizens, now and then, as I proceed, that it is of little or no consequence whether the arguments I use are plausible or not, if you do not determine to reflect upon them and to act also, should you find them correct. Many of the best and wisest men, that have lived, have justly said, that, after all, human happiness or misfortune almost altogether depends upon the virtue and abilities of the ruling men: our institutions are all good in their nature and intent, but it depends upon you, and those whom you choose, whether their objects shall be realized or not; and it is of little moment whether you had or have a declaration of independence and constitution, if you do not realize the consequences anticipated from both.

I confess, I cannot avoid lapsing into gloomy reflections, when I take up our statute book and find so very few of those substantial objects, which were to have been gained by our emancipation, at all regarded by the ruling men; every thing appears to have given way to a determination to support a foreign commerce; millions have been expended upon an inefficient marine force, to gratify the clamor of men, so blind as not to know, that our whole annual revenue in any one of our best years would not support an efficient naval force for that year: millions have also been expended upon fortifications, at some ports, to gratify other men, who are so ignorant that they do not know that the interest of this money would do more service, if annually expended in our interior; and would counterbalance all the disadvantages of half a dozen sieges.

Not one great work for internal improvement has been commenced, much less completed, since the era of our independence; not one of the emphatic recommendations, made by Mr. Jefferson at the commencement of his presidency, has been attended to. We have been kept involved in incessant negotiation with

European powers, to the great neglect of our most important concerns, and have not reflected that those nations were not deterred from internal undertakings as we have been.

I say then, that good as your constitutions are in theory, and much as they may be made to promote your happiness, something more is necessary—ruling men of virtue and abilities. When a nation carries on agriculture, manufactures and commerce, together, it is most prosperous; commerce or manufactures may support a state, or each may thrive independently of agriculture, but agriculture cannot thrive without commerce or manufactures, it must have one of them, if not both, or the farmers would become half savage. Our greatest interest is, and always will be, agriculture, but we cannot depend upon the suitable support of external commerce; we must make a market at home, and introduce manufactures also; the farmer is more interested in this than any other class. We are not like Europeans, who have no raw materials for manufactures, but those imported from other countries; we have every thing within ourselves; all we want is the means, by which those resources can be brought cheaply to every man's door—and of these means canals are the best.

To support this assumption, I offer you, as I proposed to do in my last letter, the following irrefragable testimony from your countryman Mr. Fulton: it is a document, which should be published in all our papers and almanacs, and even read at our festivals, in order to remove the prejudices that exist respecting internal improvements, and to stimulate the people to compel their representatives to do their duty.

August 24th.

MR. FULTON'S COMMUNICATION.

Sir,

BY your letter of the 29th of July, I am happy to find that the attention of congress is directing itself towards the opening of communications through the United States, by means of roads and canals; and it would give me particular pleasure to aid you with useful information on such works, as I have long been contemplating their importance in many points of view.

But a year has not yet elapsed since I returned to America, and my private concerns have occupied so much of my time, that as yet I have acquired but very little local information on the several canals which have been commenced.

Such information, however, is perhaps at present not the most important branch of the subject, particularly as it can be obtained in a few months at a small expense, whenever the public mind shall be impressed with a sense of the vast advantages of a general system of cheap conveyance.

I hope, indeed, that every intelligent American will in a few years, be fully convinced of the necessity of such works to promote the national wealth and his individual interest. Such conviction must arise from that habit of reflection which accompanies the republican principle, and points out their true interest on subjects of political economy. From such reflections arises their love of agriculture and the useful arts, knowing them to augment the riches and happiness of the nation; hence also their dislike to standing armies and military navies, as being the means of increasing the proportion of non-productive individuals, whose labor is not only lost, but who must be supported out of the produce of the industrious inhabitants, and diminish their enjoyments.

Such right thinking does great honor to our nation, and leads forward to the highest possible state of civilization, by directing the powers of man from useless and destructive occupations, to pursuits which multiply the productions of useful labor, and create abundance.

Though such principles actuate our citizens, they are not yet in every instance, aware of their best interests; nor can it be expected that they should perceive at once the advantages of those plans of improvement, which are still new in this country. Hence the most useful works have sometimes been opposed; and we are not without examples of men being elected into the state legislatures for the express purpose of preventing roads, canals and bridges being constructed. But in such errors of judgment our countrymen have not been singular. When a bill was brought into the British parliament fifty years ago, to establish turnpike roads throughout the kingdom, the inhabitants for forty miles round London petitioned against such roads; their arguments were, that good roads would enable the farmers of the interior country to bring their produce to the London market cheaper than they who lived nearer the city, and paid higher rent; that the market would be overstocked, the prices diminished and they unable to pay their rent, or obtain a living. The good sense of parliament, however, prevailed; the roads were made, the population and commerce of London increased, the demand for produce increased, and he who lived nearest to London still had a superior advantage in the market.

In like manner I hope the good sense of our legislature will prevail over the ignorance and prejudice which may still exist against canals. And here an important question occurs, which it may be proper to examine with some attention in this early stage of our public improvements—whether, as a system, we should prefer canals to turnpike roads? Our habits are in favor of roads; and few of us have conceived any better method of opening communications to the various parts of states. But in China and Holland, canals are more numerous than roads; in those countries the inhabitants are accustomed to see all their productions carried either on natural or artificial canals, and they would be as much at a loss to know how we, as a civilized people, could do without such means of conveyance, as we are surprised at their perseverance and ingenuity in making them.* England, France, and the principal states of Europe, commenced their improvements with roads, but as the science of the engineer improved, and civilization advanced, canals were introduced, and England and France are now making every exertion to get the whole of their heavy productions water-borne, for they have become sensible of the vast superiority of canals over roads.

Our system perhaps ought to embrace them both: canals for the long carriage of the whole materials of agriculture and manufactures, and roads for travelling and the more numerous communications of the country. With these two modes in contemplation, when public money is to be expended with a view to the greatest good, we should now consider which object is entitled to our first attention. Shall we begin with canals, which will carry the farmer's produce cheap to market, and return him merchandize at reduced prices? Or shall we first make roads to accommodate travellers, and let the produce of our farms, mines and forests, labor under such heavy expenses that they cannot come to market?

To throw some light on this interesting question, I will base my calculations on the Lancaster turnpike road. There the fair experiment has been made to penetrate from Philadelphia to the interior country, and the mode of calculation here given will serve for drawing comparisons on the utility of roads and canals, for all the great leading communications of America.

From Philadelphia to the Susquehanna at Columbia, is seventy-four miles; that road, if I am rightly informed, cost on an average 6,000 dollars a mile, or 444,000 dollars for the whole. On it, from Columbia to Philadelphia, a barrel of flour, say 200 weight, pays one dollar carriage. A broad wheeled waggon carries 30 barrels or three tons, and

* The royal canal from Canton to Peking, is 825 miles long, its breadth 50 feet, its depth nine feet.

pays for turnpike three dollars; thus for each ton carried the turnpike company receives only one dollar.

I will now suppose a canal to have been cut from Philadelphia to Columbia, and with its windings to make 100 miles, at 15,000 dollars* a mile, or for the whole 1,500,000 dollars. On such canal, *one mⁿ, one boy, and horse*, would convey 25 tons 20 miles a day,† on which the following would be the expenses:

One man,	-	-	-	-	-	\$ 1. 00
One horse,	-	-	-	-	-	1. 00
One boy,	-	-	-	-	-	50
Tolls for repairing the canal,	-	-	-	-	-	1. 00
Tolls for passing locks, inclined planes, tunnels and aqueducts,	-	-	-	-	-	1. 00
Interest on the wear of the boat,	-	-	-	-	-	50
Total,	-	-	-	-	-	\$ 5. 00

This is equal to 20 cents a ton for 20 miles, and no more than one dollar a ton for 100 miles, instead of 10 dollars paid by the road. Consequently for each ton carried from Columbia to Philadelphia on the canal, the company might take a toll of six dollars instead of one, which is now got by the road; and then the flour would arrive at Philadelphia for seven dollars a ton instead of ten, which it now pays. The merchandize would also arrive at Columbia from Philadelphia, for three dollars a ton less than is now paid; which cheap carriage both ways would not only benefit the farmer and merchant, but would draw more commerce on the canal than now moves on the road, and thereby add to the profits of the company.

But to proceed with my calculations, I will suppose, that exactly the same number of tons would move on the canal that are now transported by the road. Again, let it be supposed that at one dollar a ton the turnpike company gains five per cent per annum on the capital of 444,000 dollars, or 22,200 dollars, consequently 22,200 tons must be carried, which at six dollars a ton to the canal company, would have given 133,200 dollars a year, or eight and a half per cent for their capital of 1,500,000 dollars.

The reason of this vast difference in the expense of carriage by roads or canals, will be obvious to any one who will take the trouble to re-

* On averaging the canals of America, 15,000 dollars a mile will be abundantly sufficient to construct them in the best manner, particularly if made on the inclined plane principle, with small boats, each carrying six tons.

† One horse will draw on a canal, from 25 to 50 tons, 20 miles in one day. I have stated the least they ever do, and the highest rate of charges, that no deception may enter into these calculations.

fect, that on a road of the best kind four horses, and sometimes five are necessary to transport only three tons. On a canal one horse will draw 25 tons, and thus perform the work of 40 horses; the saving thereof is in the value of horses, their feeding, shoeing, geers, wag-gons, and attendance. These facts should induce companies to consider well their interest, when contemplating an enterprize of this sort, and what would be their profits, not only in interest for their capital, but the benefit which their lands would receive by the cheap carriage of manure and of their productions.

In considering the profit to accrue to a company from a canal instead of roads, there is another important calculation to be made, and for that purpose I will proceed with the Lancaster turnpike, supposing it to extend to Pittsburgh, 320 miles. On which the carriage being at the rate now paid from Columbia to Philadelphia, that is 10 dollars a ton for 74 miles, the ton from Pittsburgh would amount to 42 dollars, at which price a barrel of flour would cost four dollars in carriage, an expense which excludes it from the market. Thus grain, the most important and abundant production of our interior country, and which should give vigor to our manufactures, is shut up in the districts most favorable to its culture; or to render it portable and convert it into cash, it must be distilled to brutalize and poison society. In like manner all heavy articles of little monied value, can only move within the narrow limits of 100 miles; but were a canal made the whole distance, and by one or more companies, they might arrange the tolls in the following manner, so as to favor the long carriage of heavy articles.

The expense of man, boy and horse, as before stated, would cost only three dollars to boat one ton of flour 300 miles, this is 30 cents a barrel; suppose then, that the company receive 70 cents a barrel or seven dollars a ton, flour could then come from Pittsburg to Philadelphia for one dollar a barrel, the sum which is now paid from Columbia; thus the canal company would gain seven dollars a ton by a trade which could never move through a road of equal length. Here we see that on canals the tolls may be so arranged as to draw to them articles of little monied value, and it would be the interest of the company or companies to make such regulations. But on turnpike roads no such accommodation of charges in proportion to distance, can be effected, because of the number of horses which cannot be dispensed with.* Even were the roads made at the public expense, and toll free, still the carriage of one ton for three hundred miles would cost at least thirty-

* In my work on small canals, published in 1796, page 140 there is a table shewing a mode of regulating the boating and tonnage in such manner, that a ton may be transported 1300 miles for five dollars. Yet by this method canal companies would gain more toll than by any other means yet practised.

five dollars. But were canals made at the public expense, and no other toll demanded than should be sufficient to keep them in repair, a ton in boating and tolls would only cost three dollars for 300 miles; and for 35 dollars, the sum, which must be paid to carry one ton 300 miles on the best of roads, it could be boated *three thousand five hundred miles*, and draw resources from the centre of this vast continent.

But striking as this comparison is, I will still extend it. The merchandize which can bear the expense of carriage on our present roads to Pittsburg, Kentucky, Tennessee, or any other distance pays 100 dollars a ton, could be boated on canals *ten thousand miles for that sum*.

As these calculations are founded on facts which will not be denied by any one acquainted with the advantages of canals, it is the interest of every man of landed property, and particularly of the farmers of the back countries, that canals should be immediately constructed and rendered as numerous as the funds of the nation will permit, and the present population requires; and as inhabitants multiply most toward the interior and must extend westward, still moving more distant from the sea coast and the market for their produce, it is good policy and right that canals should follow them. In 25 years our population will amount to 14 millions; two-thirds of whom will spread over the western countries. Suppose then that 3,500,000 dollars were annually appropriated to canals, such a sum would pay for 300 miles of canal each year, and in 20 years we should have 6000 miles circulating through and penetrating into the interior of the different states; such sums though seemingly large, and such works, though apparently stupendous, are not more than sufficient to keep pace with the rapid increase of our population, to open the market and carry to every district such foreign articles as we near the coast enjoy. With this view of the subject, arises a political question of the utmost magnitude to these states—which is—

That as our national debt diminishes, and the treasury increases in surplus revenue, will it not be the best interest of the people to continue the present duties on imports, and expend the products in national improvements?

To illustrate this question, I will state some examples of the rate of duties and the expense of carriage, to prove that by keeping on the duties and making canals with the revenue, goods in a great number of instances will be cheaper to the consumer, than by taking off the duties, and leaving the transport to roads.

FIRST EXAMPLE:

Brown sugar pays in duty, two and a half cents a pound	
or for 100 pounds,	\$ 2. 50
It pays for waggoning 300 miles,	5. 00
	<hr/>
Total,	\$ 7. 50

By the canal, it would cost in boating 15 cents for 300 miles; consequently the boating and duty would amount to two dollars sixty-five cents; therefore, by keeping on the duty and making canals, sugar would arrive at the interior, 300 miles, for two dollars thirty-five cents the hundred weight cheaper than if the duties were taken off and the transport left to roads.

SECOND EXAMPLE:

One bushel of salt, weighing 56 pounds paid in duty,	\$ 0. 20
To carry it 300 miles by roads, the expense is	2. 50
	<hr/>
Total,	\$ 2. 70

By the canal it would cost for boating 300 miles, seven and a half cents. By keeping on the duties and making the canals, it would arrive to the interior consumer at two dollars thirty-two and a half cents the bushel cheaper than were the duties taken off, and the transport left to roads.

THIRD EXAMPLE:

Molasses pays five cents a gallon duty, this is for 100 lb.	\$ 0. 75
It pays for waggoning 300 miles,	5. 00
	<hr/>
Total,	\$ 5. 75

By the canal the carriage would cost 15 cents, and it would arrive at the interior, at four dollars ten cents the hundred weight, or 27 cents a gallon cheaper than were the duties taken off, and the transport left to roads.

Numerous other articles might be stated to shew that the real mode of rendering them cheap to the interior consumer, is to keep on the duties and facilitate the carriage with the funds so raised. These, however, may be considered as partial benefits, and not sufficiently general to warrant keeping on the duties. But there is a point of view in which I hope it will appear that the advantages are general, and will be felt throughout every part of the states. It is by reducing the expense of all kinds of carriage, and thus economise to each individual more than he now pays in duty on the foreign articles which he consumes.

FOR EXAMPLE:

Wood, for fuel, is an article of the first necessity: it cannot bear the expense of transport 20 miles on roads; at that distance it is shut out from the market, and the price of fuel is consequently raised the amount of the carriage; were a cord of wood carried 20 miles on roads, it would pay for waggoning at least three dollars; on a canal it would pay 20 cents; thus, on only one cord of wood, there is an economy of two dollars eighty cents—which economy would pay the duty on 14 pounds of tea, at 20 cents the pound duty;

Or 140 pounds of sugar, at two cents the pound duty;

Or 56 pounds of coffee, at five cents the pound duty;

Or 14 bushels of salt, at twenty cents the bushel duty;

Or 56 gallons of molasses, at five cents the gallon duty.

I will now suppose a city of 50,000 inhabitants, who for their household and other uses will consume 50 thousand cords a year, on which there would be an economy of 140,000 dollars, a sum in all probability equal to the duties paid by the inhabitants. For the duties divided on the whole of the American people, are but two dollars twenty-eight cents to each individual. Here I have estimated each person to pay two dollars eighty cents, yet this estimate is made on one cord of wood to each inhabitant of a city; were I to calculate the economy on the carriage of building timber, lime, sand, bricks, stone, iron, flour, corn, provision and materials of all kinds which enter or go out of a city, it would be five times this sum; and thus the towns and cities are to be benefitted. The farmer or miller who lives 20 miles from a market, pays at least twenty-two cents to waggon a barrel of flour that distance; by the canal it would cost two cents; the economy would be twenty cents; at 100 miles the economy would be 100 cents, and at 150 miles it would be 150 cents; beyond this distance flour cannot come to market by roads; yet at this distance the economy of 150 cents on the carriage of one barrel of flour would pay the duty on

7 1-2 pounds of tea;

Or 75 pounds of sugar;

Or 30 pounds of coffee;

Or 7 1-2 bushels of salt;

Or 36 gallons of molasses.

Thus it is, that the benefits arising from a good system of canals, are general and mutual. Therefore should peace and the reduction of the national debt, give an overflowing treasury, I hope you, and the majority of Americans, will think with me, that the duties should not be taken off nor diminished; for such an act, instead of relieving the people, would really oppress them, by destroying the means of reducing the

expense of transport, and of opening to them a cheap mode of arriving at good markets.

To proceed with these demonstrations, let us look at the rich productions of our interior country:

Wheat, flour, oats, barley, beans, grain, and pulse of all kinds;

Cyder, apples, and fruits of all kinds;

Salt, salted beef, pork and other meats;*

Hides, tallow, beeswax;

Cast and forged iron;

Pot and pearl ashes, tanner's bark;

Tar, pitch, rosin and turpentine;

Hemp, flax and wool;

Plaister of Paris, so necessary to our agriculture;

Coals and potter's earth, for our manufactures;

Marble, lime and timber for our buildings.

All these articles are of the first necessity, but few of them can bear the expense of five dollars the hundred weight to be transported 300 miles on roads. Yet on canals they would cost in boating only 15 cents the 100 weight for that distance.

There is another great advantage to individuals and the nation arising from canals, which roads can never give. It is that when a canal runs through a long line of mountainous country, such as the greater part of the interior of America, all the ground below for half a mile or more may be watered and converted into meadow and other profitable culture.

How much these conveniences of irrigation will add to the produce of agriculture and the beauties of nature, I leave to experienced farmers and agricultural societies to calculate.

In Italy and Spain it is the practice to sell water out of the canals, for watering meadows and other lands. In such cases tubes are put into the canal, under the pressure of a certain head of water, and suffered to run a given time for a fixed price; the monies thus gained add much to the emoluments of the canal companies.

But with all these immense advantages which canals give, it may be a question with many individuals, whether they can be constructed in great leading lines, from our sea coast and navigable rivers, to the frontiers of the several states, or pass our mountains and penetrate to the remote parts of our interior country. Should doubts arise on this part of the plan. I beg leave to assure you, that there is no difficulty in carrying canals over our highest mountains, and even where nature has denied us water. For water is always to be found in the valleys,

* Animals are now driven to market 300 or more miles, at a considerable expense and loss of flesh, for two principal reasons: first, the expense of transporting the salt to the interior; and, second, the expense of carrying the salted meats to market.

and the canal can be constructed to the foot of the mountain, carrying the water to that situation. Should there be no water on the mountain or its sides, there will be wood or coals; either or both of which can be brought cheap to the works by means of the canal. Then with steam engines the upper ponds of canal can be filled from the lower levels, and with the engines the boats can on inclined planes be drawn from the lower to the upper canal. For this mode of operating it is necessary to have small boats of six tons each. As the steam engines are to draw up and let down the boats on inclined planes, no water is drawn for the upper level of canal, as when locks are used. Consequently when the upper ponds have been once filled, it is only necessary that the engine should supply leakage and evaporation. There is another mode of supplying the leakage and evaporation of the higher levels: on the tops and sides of mountains there are hollows or ravines, which can be banked at the lower extremity, thus forming a reservoir to catch the rain or melted snow. From such reservoirs the ponds of canal can be replenished in the dry months of summer. This mode of reserving water is in practice in England for canals, and in Spain for irrigation. In this manner I will suppose it necessary to pass a mountain 800 feet high; then four inclined planes each of 200 feet rise, would gain the summit, and four would descend on the other side. Total, eight inclined planes and eight steam engines. Each steam engine of 12 horse power would cost about ten thousand dollars, in all 80,000; each would burn about 12 bushels of coal in 12 hours, or 96 bushels for the eight engines for one day's work.

The coals in such situations may be estimated at 12 cents

a bushel or	-	-	-	\$ 11. 52
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At each engine and inclined plane there must be five men

—total 40 men at one dollar each,	-	-	-	40.
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Total,	\$ 51 52
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For this sum they could pass 500 tons in one day over the eight inclined planes, which for each ton is only	10 cents.
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Suppose the mountain to be 20 miles wide, boating for each ton would cost

-	-	-	20 do.
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Total,	30 cents.
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A ton for passing over the mountain, which will be more or less according to circumstances. These calculations being only intended to remove any doubts which may arise on the practicability of passing our mountains—

Having thus in some degree considered the advantages which canals will produce in point of wealth to individuals and the nation, I will

now consider their importance to the union and their political consequences.

First, their effect on raising the value of the public lands, and thereby augmenting the revenue.

In all cases where canals shall pass through the lands of the United States, and open a cheap communication to a good market, such lands will rise in value for twenty miles on each side of the canal. The farmer who will reside twenty miles from the canal can in one day carry a load of produce to its borders. And were the lands 600 miles from one of our sea port towns his barrel of flour, in weight 200 lb. could be carried that distance for 60 cents, the price which is now paid to carry a barrel 50 miles on the Lancaster turnpike. Consequently, as relates to cheapness of carriage, and easy access to market, the new lands which lie 600 miles from the sea ports, would be of equal value with lands of equal fertility which are 50 miles from the sea ports. But not to insist on their being of so great value until population is as great, it is evident that they must rise in value in a three or four fold degree, every lineal mile of canal would accommodate 25,600 acres. The lands sold by the United States in 1806, averaged about two dollars an acre, and certainly every acre accommodated with a canal, would produce six dollars; thus only 20 miles of canal each year, running through national lands, would raise the value of 512,000 acres at least, four dollars an acre, giving 2,048,000 dollars to the treasury, a sum sufficient to make 136 miles of canal. Had an individual such a property, and funds to construct canals to its centre, he certainly would do it for his own interest. The nation has the property, and the nation possesses ample funds for such undertakings.

Second, on their effect in cementing the union, and extending the principles of confederated republican government. Numerous have been the speculations on the duration of our union, and intrigues have been practised to sever the western from the eastern states. The opinion endeavored to be inculcated, was, that the inhabitants beyond the mountains were cut off from the market of the Atlantic states; that consequently they had a separate interest, and should use their resources to open a communication to a market of their own; that remote from the seat of government they could not enjoy their portion of advantages arising from the union, and that sooner or later they must separate and govern for themselves.

Others by drawing their examples from European governments, and the monarchies which have grown out of the feudal habits of nations of warriors, whose minds were bent to the absolute power of the few, and the servile obedience of the many, have conceived these states of too great an extent to continue united under a republican form of government, and that the time is not distant when they will divide into

little kingdoms, retrograding from common sense to ignorance, adopting all the follies and barbarities which are every day practised in the kingdoms and petty states of Europe. But those who have reasoned in this way, have not reflected that men are the creatures of habit, and that their habits as well as their interests may be so combined, as to make it impossible to separate them without falling back into a state of barbarism. Although in ancient times some specks of civilization have been effaced by hordes of uncultivated men, yet it is remarkable that since the invention of printing and general diffusion of knowledge, no nation has retrograded in science or improvements; nor is it reasonable to suppose that the Americans, who have as much, if not more information in general, than any other people, will ever abandon an advantage which they have once gained. England, which at one time was seven petty kingdoms, has by habit long been united into one. Scotland by succession became united to England, and is now bound to her by habit, by turnpike roads, canals and reciprocal interests. In like manner all the counties of England, or departments of France, are bound to each other; and when the United States shall be bound together by canals, by cheap and easy access to market in all directions, by a sense of mutual interests arising from mutual intercourse and mingled commerce; it will be no more possible to split them into independent and separate governments, each lining its frontiers with fortifications and troops, to shackle their own exports and imports to and from the neighboring states; than it is now possible for the government of England to divide and form again into seven kingdoms.

But it is necessary to bind the states together by the people's interests, one of which is to enable every man to sell the produce of his labor at the best market and purchase at the cheapest. This accords with the idea of Hume, "that the government of a wise people would be little more than a system of civil police; for the best interest of man is industry and a free exchange of the produce of his labor for the things which he may require."

On this humane principle, what stronger bonds of union can be invented than those which enable each individual to transport the produce of his industry 1,200 miles for 60 cents the hundred weight? Here then is a certain method of securing the union of the states, and of rendering it as lasting as the continent we inhabit.

It is now eleven years that I have had this plan in contemplation for the good of our country. At the conclusion of my work on small canals, there is a letter to Thomas Mifflin, then governor of the state of Pennsylvania, on a system of canals for America. In it I contemplated the time when "*canals should pass through every vale, wind round each hill and bind the whole country together in the bonds of*

social intercourse;" and I am now happy to find that through the good management of a wise administration, a period has arrived when an overflowing treasury exhibits abundant resources, and points the mind to works of such immense importance.

Hoping speedily to see them become favorite objects with the whole American people.

I have the honor to be, your most obedient,

ROBERT FULTON.

Washington, December 8th, 1807.

LETTER VIII.

HAVING shewn the importance and even necessity, of internal improvements, and particularly noticed the great superiority of water communication, I will now proceed to inquire, what works the legislature ought, in my opinion, to undertake or aid, immediately.

Mr. Gallatin in his report upon roads and canals, says, that the mere trade, between the extremes and along the banks of a canal, will rarely justify the expense of making one; and that to be productive, the canal should open a communication with a naturally extensive navigation. The term productive, means, I suppose, that the amount of tolls should be such as to pay interest for the money expended and to pay for repairs: if we are to have no canals until there shall be a certainty of such an immediate amount of income, we shall indeed have but very few; but we should not calculate in this way—as we have resources, let us employ them in improving our interior and in increasing our population, which will to a certainty produce abundant interest at least, even by tolls; and let us not hoard them up in banks, by which means we shall lose not only the tolls, but the immense effects of interior improvement upon the virtue and prosperity of the people. If we make appropriations annually and trust to the result for interest, the commonwealth will flourish; but if we must wait to lay out our money, until we can calculate upon no loss whatever, we shall remain as we are, excelled by the enterprize of many of our neighbors.

It was not, however, in order merely to renew the expression of this sentiment that I alluded to Mr. Gallatin's remarks: my

object is to shew, that, even if they were perfectly correct, they do not apply to Pennsylvania; that is, admitting that we ought first to be certain of gaining interest upon the capital invested, I think we may safely commence our operations in this state. 1st. Upon the foundation of our own immediate trade; and 2dly. Because it is in our power to obtain the naturally extensive exterior navigation, to which Mr. Gallatin alludes. Our own interior resources are immense, and they must become every day more and more necessary to supply the wants of our manufactures; even our present domestic trade supports high expenses, in the time, labor and money consumed in road transportation; and this trade must increase in proportion to the facility and cheapness with which it may be carried on. But should there be the least doubt upon this head, none whatever can exist after an examination of the immense natural navigation, to which such a communication will lead: the rivers flowing into the north west and south west lakes, are channels through which a trade may be opened, of the magnitude of which we can form no accurate conception.

There is now no speedy, safe, or cheap mode of communication between the Atlantic and the lakes: the consequences of this are, 1. There is not a tenth part of the resources of the western country brought into operation; 2. The farmers raise no more than is necessary for their own consumption, and for barter for store goods; or if a large surplus is raised it is sold to men of capital, monopolists, at little more, often not more, than the price of labor employed in producing it; 3. Those, who having raised large quantities of produce, transport it to New-Orleans, lose two or three months in conveying and selling it there, and they are then obliged to consume two or three months more in going around to an Atlantic port, to purchase and send, at an enormous cost for land carriage, such articles as they want in return for their produce. It is evident therefore, that a speedy and cheap route between the lakes and the Atlantic, is absolutely necessary to the virtue as well as to the interests of the mass of the western people. That state, which shall first open such a communication, will give an important impulse to its own internal resources, will enrich itself by the passage of an immense import and export trade, and will be the most likely

to preserve that trade, even after other states shall have opened other routes of communication.

It is to this object, so much the most important of all others, that I think legislative attention ought to be first directed; for this all minor objects ought to be abandoned, and private enterprize invited and aided; because in proportion to the progress of this great work, those of a less important description would naturally be undertaken, even by private enterprize, and would probably be thus completed.

Two questions, then, necessarily occur in this place; 1st, Is this work practicable and by what route? 2d, If practicable, what are the best means for commencing and carrying it on?

To the first question, two gentlemen, who have acquired much reputation, from their remarks upon internal improvement, I mean Mr. Gallatin and Mr. P. B. Porter, seem to have answered in the negative; and it may therefore be well, in the first place, to notice what they have said respecting Pennsylvania.

I am of opinion that there should be nothing like jealousy between the states, as to internal improvements, because the welfare of each is not only conducive but essential to the welfare of the rest. Yet, it is allowable to assert the reputation of a state, when it is slighted, or when its circumstances are misunderstood or misrepresented. To notice the manner in which Mr. Gallatin has spoken of Pennsylvania, and the attempt of Mr. Porter to shew a superiority on the part of New-York rivers over those of Pennsylvania, for which there is in reality no foundation, is indeed a duty. As Mr. Gallatin was required to report in his official character as a high officer under the union, upon roads and canals, he ought, not only as a matter of justice but of policy, to have enumerated the respective advantages of the states; yet, to me at least, it appears, that he was particularly desirous to explain the advantages of the Potomac and Hudson, as channels of communication with the lakes, and that he took little or no pains to give that character to the Susquehannah, which its importance merits.

In page 24, of his report, Mr. Gallatin very particularly notices the relative distances to be passed by turnpike roads, from the Atlantic to the western rivers, with the exception of the Pennsylvania route; and his excuse for the omission is, that the ex-

tent to which some of the Atlantic rivers may be navigated is not ascertained. It is rather singular that the Susquehanna should be the only river excepted, and as much so that Mr. Gallatin did not endeavor to ascertain the distance between the waters in our state. He gives the distance from Washington city to the confluence of the Monongahela and Cheat rivers, as but 150 miles in a straight line; and the distance from Philadelphia to the Conemaugh and Loyalhannon branches of the Allegheny at 220 miles; this is no doubt correct; but it is the relative distance of land carriage, that is to decide whether the Potomac or Susquehanna is best fitted as a route of communication. It is to be observed, then, that the shortest portage on the Potomac route is from the mouth of Savage river to Dunkard bottom on Cheat river, something more than 37 miles; and that the road or portage really laid out as best, extends, according to Mr. Gallatin's own account, 72 miles. But when Mr. Gallatin speaks of the Pennsylvania portage, he merely says, it is "somewhat shorter;" the fact is, that the average extent of the several portages from navigable Atlantic waters to navigable western waters, in Pennsylvania is little more than one-fourth of the portage by the Potomac.

But it is with Mr. Gallatin's remarks respecting the Susquehanna, in pages 22, 32, 33 and 34, that I find most fault. This is a river which Mr. Fisher Ames declared, affords water communication to 50,000 square miles, and which Mr. Latrobe declares to be the principal of all our primary rivers; it is of such magnitude, says that gentleman, that no gap or sluice, artificially cut, can materially affect the rapidity of the stream. "Of the numerous rivers of this state, (says another intelligent writer,) no one presents such a prospect of internal commerce, with so extensive, so complete, and so convenient a communication with the Atlantic, as the Susquehanna and its branches. Perhaps we may say, with truth, that no two rivers in the United States possess equal advantages. The Mississippi and Ohio flow through a greater extent of country, but, when it is considered that the territory, which they water, is as yet (1795) quite uncultivated, and must remain so for many succeeding years: that the navigation through them, is not only difficult and dangerous, but lengthy in the extreme, and that the Susquehanna opens the

most ready communication with the lakes, perhaps even these extensive rivers cannot be considered as exceptions to the observation."* And, indeed, Mr. Gallatin himself in one part of his report, calls the Susquehanna "the most considerable Atlantic river," yet there is not one sentence in his report in favor of it as a route of communication between the Atlantic and the lakes, on the contrary he pronounces such a route by rivers and canals impracticable. The Hudson is the only river, which he recommends, under the head of "communication between the Atlantic rivers and the St. Lawrence, and the lakes," as a practicable route, and accordingly he proposes to expend within the state of New-York, the sum of *four millions of dollars*, whilst Pennsylvania is to receive but little more than one-eighth of that sum. I confess I see nothing in Mr. Gallatin's report, that appears to justify this distinction; and I am the more surprised at it, besides, as I am of opinion that a perfect water communication between the Pennsylvania Atlantic tide-water and the lakes, might be opened for one half the sum defined for New-York. This, too, is taking Mr. Gallatin's calculation for New-York as correct, which I do not admit, for I am confident a canal around the falls of Niagara, will cost more than the sum mentioned by him, viz. one million of dollars.

Treating of a communication, between the Atlantic and the lakes, page 22, Mr. Gallatin says; there is no place amongst the ridges, which divide the upper branches of the Susquehanna, which is not of an elevation much beyond what has ever been overcome by canals in any other country; "the impracticability arises from the principle of lock navigation, which in order to effect the ascent, requires a greater supply of water in proportion to the height to be ascended, whilst the supply of water becomes less in the same proportion." There is no doubt about the principle of lock navigation, but there is no sort of evidence, that I can discover, for the previous assumption. Mr. Gallatin admits, in one part of his report, that the extent to which the Susquehanna may be navigated, is not ascertained; but how is it decided that there is an elevation between the western and eastern waters, that exceeds the utmost height to which the

* See a work, in the city library, entitled "Susquehanna navigation."

Languedoc canal was carried? So far from this being the case, I am warranted in saying, by all the books, maps and oral information, which I have been able to obtain, that the reverse is the fact.

As Mr. Latrobe very justly remarks, the course of our rivers is not, as in other parts of the world, between, but across our mountains, and vallies. The mountains in our state pass in a direction nearly diagonal, or from the north-east to the south-west. The west branch of the Susquehanna rises at the north-western spurs or foot of the most western ridges, passes along some of the extreme ends of those ridges nearly in a north-eastern direction, and then glides through them, until after having passed the Bald Eagle mountain, it turns short to the south, where Muncy creek falls into it, and proceeds nearly in a southern direction until joined by the north-east branch at Sunbury. The heads of the river interlock in several places with navigable creeks flowing into the Allegheny, and I am assured that no ground dividing the two waters is as high as has been overcome by locks in our own country, at the Potomac falls. It is certain that there is not a single fall or rapid in the river above Swatara, and that the western branch is navigable 155 miles above Sunbury, for vessels above 10 tons; at the end of that distance it branches off and interlocks advantageously with Toby's creek in particular; by the Sinnemahoning it is separated from the Allegheny by a portage of about 20 miles, where there is a sufficiency of water for a feeder, and none of which requires such lockage as the works before mentioned in our own country. As to the quantity of water, the Susquehanna has as many and as abundant tributary streams along its whole extent as any other river in the United States.

Mr. P. B. Porter is more excusable than Mr. Gallatin; he spoke as the representative of a particular state, and perhaps knew nothing of the Susquehanna but from Morse's abridged gazetteer, which condescends to say that that river has a navigation of 20 miles! However, he speaks quite as boldly as, or indeed more so than, Mr. Gallatin; for he asserts in positive terms, that "the only practicable route for an ascending navigation to the lakes is by the Hudson and Mohawk:" the foundation for this assumption is as erroneous as the hypothesis itself, "because the

Hudson is the only river, whose tide-waters flow above the eastern chain of mountains." One might suppose from the mere perusal of this, that the Hudson tide-water ascended to the lakes or to some navigable waters connected with them; but the fact is not so, after ascending the Hudson to Albany, there is a portage of 14 miles to the Mohawk, and from thence there is a difficult navigation to the Oneida lake of about 100 miles more, which Mr. Porter himself admits could not be opened by a canal at a less sum than 2,200,000 dollars: and, even if this were all accomplished, the only communication opened would be with lake Ontario and the St. Lawrence, for before a communication with lake Erie and the south-west lakes could be accomplished, there should be another canal around the falls of Niagara, which, as I said before, would cost considerably more than Mr. Gallatin estimates. If this were the only practicable ascending navigation, every state in the nation ought to rejoice at the appropriation of the immense expenditures calculated to accomplish it, but until it can be shewn that there are not other and more convenient routes, it would be injustice to other states, to give such a distinction as Mr. Porter claims for New-York: do all that can be done for it, but no exclusive privilege can be justified.

From the remark or reason given for the exclusive excellence of the Hudson route, it would seem, besides, that Mr. Porter limits the practicable ascent of rivers to the head of the tide-water: it is fortunate for Pennsylvania, however, that many of her citizens know that the west branch of the Susquehanna can be ascended nearer to the lakes than the Hudson is, that the portage from the Susquehanna to the Allegheny is as short as the portage from the Hudson to the Mohawk, and that the navigation of the Allegheny and Conewango creek to Chotaque is infinitely superior to the navigation of the Mohawk, &c. to Ontario.

But, if there is any superiority in the connection with the lakes, by means of the Ontario, there again Pennsylvania has advantages superior to New-York, supposing that both states should exert themselves to improve their respective waters. The north-east branch of the Susquehanna may be ascended to lake Otsego, which is within ten miles of the Mohawk, and sixty miles nearer lake Ontario than the tide-water of the Hudson;

the north-west branch of the Susquehanna is still more important, as I shall still more particularly shew in my next letter, it may be ascended as high as Bath in Steuben county, New-York, from whence the portage to Crooked lake is not ten miles, and from this lake to lake Ontario there is an uninterrupted water communication.

What I have thus said answers the remarks made by Mr. Gallatin, as well as those made by Mr. Porter: the more we investigate our situation and means, the more we shall be satisfied of their importance, and, of their being at least, equal to those of our neighbors; and of course the more we ought to improve them. The observations of Mr. Gallatin and Mr. Porter prove that our negligence has been mistaken for inability, and they should now stimulate the legislature to direct a complete and accurate survey of all our rivers, &c. to be taken, in order that our true circumstances may no longer be misunderstood.

August 27th.

LETTER IX.

I HAVE said that Pennsylvania would derive immense advantages from the establishment of a cheap and good route of communication between the Delaware and the lakes, and that the best mode of communication would be by water. The practicability and route of this communication is now to be considered.

That our foreign trade, however beneficial it may have been in other respects, has had an injurious influence upon our own internal concerns and improvements, there cannot, perhaps, be a better proof, than that which is furnished by the silence, which has prevailed in this commonwealth, respecting a communication with the lakes, during the last fifteen years in particular. I have not been able to find a single act of the legislature, passed within that time, having any such important object in view, nor have I found more than two publications of any consequence urging the legislature to the undertaking. Our interests and our feelings have been too much involved in the concerns of foreign nations; a host of foreign merchants, having no objects but their own gain, have withdrawn the regards of many of our own good

citizens from the real interests of their country, and have largely contributed to reduce the country to its present condition. It is now, therefore, when foreign trade, the cause of domestic apathy, is nearly annihilated, that we should be employed in inquiring what has been done, and in doing what ought to be done.

In the year 1795, a very interesting work was published, to make known the natural advantages of this state, entitled, "An historical account of canal navigation in Pennsylvania."

On referring to this pamphlet, and comparing it with subsequent statements and maps, I find it singularly correct; upon these bases, therefore, I will now shew the practicability of opening a communication between the Delaware and the lakes, by various routes, all of them as favorable as any route through any other state, and as easily opened. The routes uniformly mentioned are these, which I shall designate, *northern*, *middle*, and *southern*. I have founded a part of the calculation, relative to the communication between the Schuylkill and Quitapahilla, upon Mr. Weston, the engineer's report.

THE NORTHERN.

From Schuylkill tide-water to Tulpehocken creek,	61
Canal partly opened from Tulpehocken to Quitapahilla,	34
Down Quitapahilla to Swatara,	15
Down Swatara to Susquehanna,	23
Up Susquehanna to west branch at Sunbury,	65
Up west branch to mouth of Sinnemahoning	106
Up Sinnemahoning to its forks,	15
Up its north branch,	19
Portage to river Allegheny,	23
Down Allegheny to mouth of Conewango,	76
Up Conewango to Chetauqua lake,	28
Across the lake to its head,	17
Portage from Chetauqua to lake Erie,	9
Miles,	491

Of these, including the canal, but partly opened, 459 are water, 32 by land. The portage at the Sinnemahoning, I am told, may be easily converted to lock navigation, and that between the Chetauque and Erie certainly can be improved either

by a canal or by a rail road, on which one horse might draw four tons.

THE MIDDLE.

From Philadelphia to forks of Sinnemahoning, as above,	319
Up west branch of Sinnemahoning,	24
Portage to Little Toby's creek,	14
Down Little Toby's creek to Main Branch,	10
Down main branch of Toby's creek to the Allegheny,	70
Up Allegheny to French creek,	35
Up French creek to Presqu' Isle,	81
Portage to lake Erie,	15
Miles,	568

Of these, including canal, 539 water—29 by land. This route might be advantageously altered, by passing by French creek and proceeding up to the Conewango as in the northern route.

THE SOUTHERN.

From Philadelphia to Susquehanna, as above,	133
Up Susquehanna to the Juniata,	23
Up Juniata to the mouth of Poplar run,	128
Portage from Poplar run to the canoe place on the little Connemaugh,	14
Down the Connemaugh and Kiskeminitas to the Allegheny,	87
Down the Allegheny to Pittsburg,	29
Miles,	414

The society, which existed in 1791, "for promoting the improvement of roads and inland navigation," gave the preference to this last route. "The expence" they said in the memorial to the legislature "even including the canal (then contemplated at but four miles) does not exceed the sum requisite to complete a good road of 50 or 60 miles in some of the interior parts of the state"—the sum mentioned is about 108,000 dollars. Of the practicability of this route, they speak with the utmost confidence, and, indeed it is known that there have been instances in which, during the spring, flat boats with 170 barrels of flour

each, have come 86 miles down the Juniata to its junction with the Susquehanna. I must confess, however, that I consider either of the other routes preferable: 1st. Because the portage on this route, although but 14 miles, is across the Allegheny mountain: 2nd. Because the Juniata is by no means so good or steady a stream as the west branch of the Susquehanna; and, of its navigation from Huntingdon to the foot of the Allegheny, so little is known or said, that it is to be presumed it is not very good: 3d. Because the country to be passed through is by no means so productive or important as that bordering the Susquehanna. It is true, that the southern route is more direct to Pittsburgh, but it is the least direct to the lakes; it is above 40 miles further from the Delaware to the lakes by this than by the northern route. The intercourse with Pittsburgh was, no doubt, an object of great moment in 1791, it is still of much importance, but it is not the only one now to be considered; that course should be taken, which should be calculated to answer all our purposes.

It is very probable that the middle route by Toby's creek might be advantageously opened, but it is to be recollected that if it should not, the benefits of that navigation might be connected with this route adopted, and even made subservient to it.

Of the three, however, I prefer the northern, and think it most deserving of legislative attention. In the first place we have authentic evidence that the river Susquehanna is navigable to the Whet-stone at the mouth of the Sinnemahoning; and the commissioners appointed by the legislature to survey the north branch of the Sinnemahoning, have declared that its navigation may be easily improved. In the next place, the waters of the Allegheny and Connewango are now capable of any sort of navigation necessary, and at all times of the year, to Chetauque lake; at the mouth of the Connewango an improvement might be made, at a trifling comparative expense, which would greatly aid the communication, but it is not absolutely necessary to the intercourse. Among other advantages, possessed by the northern route, are these; 1. The distance between the Atlantic and lakes is by this route shorter than by any other; 2. There will be less unnecessary ascending navigation by this way than by any other; 3. This route is not as long from the Delaware to Pittsburgh, as

the southern route is from the Delaware to the lakes; 4. This route, at the same time, that it opens a complete communication with the Ohio, must become the great thoroughfare, for the trade with our own immense north-western lands, and for the still more important trade with the south-west part of New-York.

The reasons, which induced the society before mentioned, to reject this route, if they had any weight in 1791, cannot, in my opinion, have any now. They say, in their memorial to the legislature, speaking of the northern route, "a considerable part of it lies in the state of New-York, in a country as yet unsettled; and, although it leads in the most direct way to the lakes, it cannot be of any great use in the main communication with the Ohio and Mississippi, by the way of Pittsburg, which is the great object of present consideration."

It is true that about one half of the Conewango creek and the whole of Chetauque lake are within the New-York line; but the country is no longer unsettled as it was in 1791; nor is any improvement necessary in that part of the water communication, it is excellent, and the portage of nine miles is equally good, passing over good ground and by a gradual descent from Chetauque to Erie. Whatever may be the policy of New-York, therefore, it cannot affect us; and, instead of apprehending any thing on this score, we may be assured that the public and private enterprize of that state will aid any improvement that may be undertaken by us. This route, however, being confessedly the most direct, and as it passes through immense tracts of as fine country as any in the world, it has a claim to preference. The objection respecting a communication with Pittsburg, I have already noticed, it has no force, for if there is a disadvantage in an up-stream navigation from Pittsburg to the Conewango, it is more than counterbalanced by the descending or returning navigation, which will long remain the most important; for, if this communication were opened, much of the produce now sent down the Ohio would still go in that direction, but the import from the Atlantic would all pass through this state.

I have sometimes heard another route mentioned, which, however, I cannot positively recommend; yet it may be well to mention it, to shew that there are a variety of ways in which the state may attain an all important object. One of the best streams

flowing into the Susquehanna is Pine Creek, it joins it at the foot of the Bald Eagle mountain; this stream is navigable at this time for small boats, and might be made navigable for boats of ten or twelve tons burden as high as within eighteen miles of the town of Coudersport upon one of the heads of the Allegheny, from whence there is a good water communication to lake Chetauque. If the water part of the route could be made as perfect as I have been assured it can, the whole necessary portage from the Delaware to lake Erie, (presuming that the canal from the Schuylkill to Swatara should be finished) would be but 28 miles.

It is sufficient, however, to know, that societies as well as individuals concur in declaring that either of the three first routes is practicable; Mr. Fulton has shewn that if a mountain 800 feet high interrupted the communication, it might be passed by water at an expense which the profit of this route should, and no doubt would induce companies to undertake; the southern route is the only one that has such an obstacle, the Allegheny at the Frank's town branch of the Juniata, the middle or southern route may be opened as a water communication from the Delaware to lake Erie. The legislature, which has the ability, and which is bound by duty, to improve one of them, to an extent commensurate with all our wants, would, no doubt, fix upon that route, which, upon actual survey and examination, should be found to possess the greatest extent of water communication, and the least extent of portage, or rather that route which art can most easily alter, so as to make the whole extent navigable.

I know no work, which would obtain for this commonwealth such lasting benefit, as this; there is nothing, which a legislature could do, that would have so fair a claim to public gratitude. Pennsylvania, from the extent and number of her rivers and streams, seems to have been intended by nature as the great avenue, through which intercourse should take place between the millions on the east and on the west; how shameful would it be, even if we had to resort to taxation, not to complete what nature has so bountifully begun; how much more disgraceful will it be, if with the full means that we possess, we should neglect our duties and our interests.

August 29th.

LETTER X.

ENOUGH, I presume, has been said, to remove doubts about the practicability of a water communication between the Atlantic and the lakes, through Pennsylvania: about the importance of such a route there can be no difference of opinion among those who understand the true interests of the state; the next inquiry, therefore, is, in what manner should the legislature commence the opening of this *grand canal*?

I have heretofore often said that the mere amount of tolls or interest for the capital employed in any great public work, deserves no consideration when compared with the immense benefits, diffused by that work, amongst the people at large—or, in other words, that it is the height of folly to suspend any great undertaking, which if completed would improve every man's estate, from an apprehension that the interest of the money will not be at once obtained. It is, nevertheless, the duty of the legislature to produce both results, if they can. For instance—if the legislature were to direct that the waters in the north-west part of the state, should be the first improved or that the contemplated canal should be commenced in that quarter, we know that the country would be benefitted by it, but we also know that for many years, or until the completion of the whole route to the Susquehanna, this work would be expensive instead of profitable. It must be evident, therefore, that it is best to begin opening the great water communication to the lakes, in that part of the state which, being already highly improved and thickly settled, would use the canal most, and which by increasing the quantum of tolls would give aid in going on with the works westwardly. Indeed, this proceeding must also appear obviously useful, when it is considered that, the export is to be made to, and the import from, the east, and as seven-tenths of the water will flow from the westward.

To some persons such arguments as these may appear superfluous: but by those, who know any thing of the prejudices prevailing amongst your representatives, these remarks will be considered as absolutely necessary. Such indeed has lately been the unaccountable disinclination to commence or aid any works on the Atlantic border, such has been the still more inscrutable

jealousy of persons proposing public improvements, that it is as necessary to make others believe us honest as that we should know we are so ourselves. Whilst I am touching upon this point, I cannot omit this opportunity to urge you, my friends, to check such impolitic and ungenerous conduct on the part of your representatives: for a long time I attributed it to the political character of this part of the state, and if that was so it was as improper as it is now; but there is no longer even that excuse, Philadelphia in every respect deserves the affection of the state, it gives the commonwealth much of its reputation at home and abroad, it has more charitable and benevolent institutions than all the rest of the state, it contributes, more than all the rest of the state to defray the ordinary expenses of our government, and it can have no interest distinct from that of the commonwealth. I would not have any other part of the state made tributary to this city, I would not wish to deprive those living near Baltimore of the best means for getting there, but I think the state should aid Philadelphia, when that aid, besides serving the city, cannot but be of service to the state also. Let me repeat then—remove unworthy prejudices.

To return to my subject: my opinion is that the legislature ought to take measures for opening a communication between the Delaware and the lakes, *from the Delaware*. There is another reason, besides, in favor of this course, *much has already been done here*, and of this it is necessary to speak.

In the year 1789, various and judicious plans were proposed to the legislature, for improving the state, by a variety of intelligent and patriotic citizens, to the labors of which I have heretofore with pleasure alluded. At the instance of this society, commissioners were appointed by law, in 1790, to explore the several routes proposed for a communication between the Delaware and the lakes; they were instructed to report upon the practicability, the best route and the expense. The commissioners performed this duty promptly and reported, 1st. That a communication was practicable; 2d. That the best route was by the Juniata, or that which in my last letter I designated as *the southern*; 3d. That all the intervening rivers could be cleared and opened, for about 108,000 dollars.

The legislature, paying credit to the commissioners, and being aware of the importance of such a route, determined to commence it in that quarter, which it was supposed offered the greatest obstacle and promised the greatest advantages. Hence originated the incorporation of two companies, whose proceedings it is necessary to mention.

THE SCHUYLKILL AND SUSQUEHANNA COMPANY,

Was incorporated in 1791, with a capital of 400,000 dollars, for opening a canal communication, between the Schuylkill and Susquehanna rivers, by the following route; from Reading on the Schuylkill, by the Tulpehocken creek, to Myer's town 37 miles; from Myer's town to Lebanon, the summit-level, by a canal four; from Lebanon to the Swatara creek; 15; down the Swatara to the Susquehanna 23; in all 79 miles.

THE DELAWARE AND SCHUYLKILL COMPANY,

Was incorporated the year following, 1792, with a capital also of 400,000 dollars, for opening a canal from Philadelphia along the east bank of the Schuylkill, 16 miles, to Norristown.

The legislature declared, as the principal object of both these works, the opening a communication between the eastern and western waters.

As soon as these companies were organized, committees were appointed by them to superintend the commencement of the respective works. Unfortunately there was no engineer at that time, in Pennsylvania, competent to aid the committees; they, therefore, sent to England and engaged Mr. William Weston, a celebrated engineer, to come out and manage both works. In the mean time the committees did not think it proper to remain idle, they commenced the respective undertaking, and had each in considerable forwardness, when Mr. Weston arrived, in January, 1793. This gentleman immediately proceeded to examine the work done by the Susquehanna company, at Lebanon canal, and reported—"From such a view as the time and season of the year would permit me to take of the canal through the middle ground near Lebanon, I have little doubt, but the most favorable line has been adopted." He also examined the Delaware and Schuylkill canal, and reported generally, "it appears to be judiciously laid out."

Experience has proven, however, that, it would have been much better, if the companies had not commenced any of the works, until Mr. Weston had had full time to make every necessary inquiry, for after Mr. Weston had an opportunity to judge accurately, he recommended alterations in both the plans originally projected, upon which the companies had commenced. This was the first obstacle to the work, and one of the causes of its ultimate decline.

During the whole of the year 1793. Mr. Weston devoted his attention to both canals, and in January 1794, made a detailed report respecting them. With respect to the Schuylkill and Susquehanna communication, he said 1st. That the unerring test of experience had proven the inefficacy of such a place as the company had originally adopted, namely the making a water communication by the beds of the Tulpehocken, Quitapahilla, and Swatara; 2d. That a canal 70 miles in length from the Schuylkill to the Susquehanna, chiefly along the banks of the Tulpehocken and Quitapahilla, would be infinitely preferable; 3d. That, the expense of completing the work upon this plan would be, in addition to the 400,000 dollars already subscribed, 821,330 dollars and 60 cents. Having submitted this statement to the company, Mr. Weston left it to their discretion, in what way to proceed.

The company were soon convinced of the soundness of Mr. Weston's advice, and accordingly they presented a memorial to the legislature, setting forth:

1st. The Susquehanna and Schuylkill canal is the greatest link in the chain that is to connect the eastern and western waters.

2d. The summit-level of this canal for upwards of four miles is completed, in respect to the heavy digging, and the purchase of all the ground for the scite of the canal, the locks and towing paths; as well as the grounds containing the sources and springs of the waters, and through which they are to be conducted into the reservoir at the summit-level.—The final amount of expenditures on this part will be 106,666 dollars and 60 cents.

3d. We approve Mr. Weston's plan of a canal instead of making use of the beds of the creeks, and as the original capital will not pay more than one-third of the whole expense, we pray

legislative aid, by a loan of a sufficient sum upon interest, so as to enable us to finish the work.

The company anticipating legislative aid, continued the work under the guidance of Mr. Weston, during the whole of the year 1794. In December of that year, that gentleman made a report, from which I quote these interesting parts:

“I flatter myself that the progress made on the works, in the short space of seven months, will prove satisfactory to the board. On a careful comparison of the actual state of the various works, and an ample allowance for the completion of such parts as remain unfinished, with the previous estimate laid before the board in my last report, it appears, that from the east end of the summit-level to Michael Kreitzer’s plantation, a distance of more than four miles and a quarter, the actual expenditure will fall short of the estimated one, at least eight thousand dollars. Though I would not wish to appear too sanguine, yet I may be allowed to draw favorable inferences of the remainder of the line; independent of this, I have well founded reasons for asserting, that the works will rather proportionably diminish than increase in expense, as the important object of land-carriage will, after the ensuing year, in a great measure, be done away, by the canal being made subservient to that purpose.

“From the difficulty of procuring waggons to haul bricks, lime, &c. I could not employ half the number of bricklayers I had at first contemplated; yet more work has been done in four months, than is generally executed on most canals in one season. *Five locks* of six feet fall, and two road bridges are completed; and such progress made in the sixth lock and two more bridges, that a fortnight’s work in the coming spring will suffice to finish them.”

Such was the flattering account of this important work at the close of 1794; yet in this state it was suspended, and has not since been improved.

Having thus briefly noticed the rise and fall of this undertaking between the Schuylkill and Susquehanna, I will take a similar review of the Delaware and Schuylkill canal.

In less than three months, after his arrival, Mr. Weston made a report upon this canal, it was highly flattering: in December, 1794, he made another report, in which he said; 1st. That one-

third of the work, above five miles, was finished, and that contracts were formed and forming for a vigorous prosecution of the remainder; 2d. That the whole canal of 16 miles could be completed for the sum authorised by law, 400,000 dollars; and 3d. That if the stockholders would punctually pay the sums subscribed by them, a toll for a part of the canal might be drawn in 1796, and the whole completed in 1797 or 1798.

Although this report was calculated to call forth the activity of the company, it had not that effect; the stock-holders become gradually backward in paying their subscriptions, and of course the work began to languish. It was not, however, speedily abandoned by Mr. Weston; he continued his services and reported in February 1796, 1st. That nearly six miles of the canal were navigable; 2d. That the most difficult parts of the route were overcome; and 3d. That it would be best to complete two miles more at the south-east end of the canal, from the three miles completed north-east of Philadelphia, to the falls of Schuylkill.

Nothing, however, could induce a great number of the subscribers to pay in the instalments, agreeably to their engagement, and thus the work ceased from the want of funds.

Under these circumstances, the stock-holders of the Susquehanna and Schuylkill, and Schuylkill and Delaware companies, who had made good their engagements, petitioned the legislature to aid them. The legislature accordingly passed a law, authorising the two companies to raise by way of lottery 400,000 dollars, two-thirds for the Susquehanna and Schuylkill, and one-third for the Delaware and Schuylkill canal. The first class of the lottery was drawn, the prizes duly paid, and 50,000 dollars realized by the companies; but after the second class had been drawn, it was found that the whole of the prizes could not be paid. This result has never been satisfactorily accounted for, but I have been told that the misfortune originated in this way; as the tickets were sold, the proceeds were applied to carrying on the works, upon the assurance that the delinquent subscribers would meet their engagements in time to afford funds to pay the prizes; those subscribers, however, did not pay their instalments, and the failure to discharge the prizes was the consequence.

It appears, then, that the causes of the stoppage of both these important works were these; 1st. The novelty of the undertaking and consequent mismanagement at the out-set; 2. The failure of the subscribers to fulfil their engagements. To afford some idea of the extent of the last mentioned evil, I state, that two of those, who had subscribed for the largest number of shares, not only evaded payment upon any of them, but appropriated 28,000 dollars of the money paid by others to their own use, and having subsequently failed the whole was lost.

The total amount expended upon the Delaware and Schuylkill canal was 221,710 dollars and six cents. The sums expended in making the works at the summit-level between the Schuylkill and Susquehanna, and in purchasing ground for the canal, locks, towing path &c. amounted to about 250,000 dollars.

Although nothing has been done, since 1796, at either of the works, it has not been owing to any want of energy on the part of those subscribers, who had embarked capital in either undertakings; on the contrary every step has been taken by them, to obtain legislative aid, in order to save the capital they invested, and which has since 1796 been wholly dormant, and also to promote the interests of the state by such valuable improvements.— These applications have not, however, been attended to, as they ought to have been, and the consequence has been, that many consider the sums invested as almost, if not wholly lost. A few persons, possessing capital and enterprize, have redeemed the credit of the companies by paying debts, prizes, &c. and by preserving the real estate from seizure; both companies have given the guidance of their concerns to those individuals; and it is yet to be seen whether the legislature will aid them in accomplishing an object no less important to the state at large than necessary to the relief of those particular persons.

I have been thus particular, in stating the origin, progress, and present condition of these works, in order to shew the propriety of commencing the great communication between the Atlantic and the lakes, at that part of the state, where so much has already been done. I have shewn you that the state is fully able to commence and complete by annual appropriations, this great undertaking: if your representatives are worthy the cha-

racters of legislators, they will begin the work at once by co-operating with those, who hold the stock of the two companies: how, or in what manner this co-operation should be effected is not very material so that it should take place. I have not a doubt but that the companies (who are now as it were under the protection of the commonwealth) will gladly enter into any such measures as an enlightened legislature can propose.

With regard to the profit, that a completion even of the eastern part of this canal would furnish, I have now calculations before me, but they are too long for insertion at present: it is enough in this place to state:

- 1st. Cost of a complete canal communication of
70 miles, from the Schuylkill at Reading to
Middletown on the Susquehanna, \$ 1,121,333 33
- 2d. It is calculated, that in 1795, the tolls on this
canal would have amounted to, - 167,634 00
- 3d. Which, at a dividend of 12 per cent, per
annum, is equal to a capital of 1,440,180 33

It may be very safely affirmed, that population and settlement have so rapidly advanced since 1795, that, if this canal were completed, the dividends upon the cost or capital expended in making it, would exceed the maximum allowed by law, 25 per cent and of course that the toll would be reduced.

Profitable as this would be, the Delaware and Schuylkill canal would be infinitely more so:

- 1st. The canal could be completely made from
the Delaware at Philadelphia to Norristown
—for - - \$ 400,000
- 2d. It is calculated, that, in 1795, the tolls on
this canal would have amounted to - 165,722 66

Making a dividend of 41 per cent, upon the capital or cost, at one-sixteenth of a dollar per ton per mile: reduce this to the maximum by law, and calculate the increase of population, &c. since 1795, and it may be fairly inferred, that the tolls upon this canal if it were now completed, would not exceed two cents per ton per mile—that is, for ten barrels, conveyed from Norristown to Philadelphia, 16 miles, but 32 cents.

Indeed I am satisfied, that, the actual profits upon all those canals would exceed the calculations that have been made even

by their most sanguine friends. So that, instead of being burdensome to the state, these works would enable it to realize eight or ten per cent, per annum more than it now realizes from its most productive bank stock.

What would be the income if the canal was opened to the lakes? is a question that I put home to every one of you; but you cannot answer it, you are lost in the extensive space that opens to your imaginations; the effects would be so astonishing that you cannot anticipate them, and if you attempted to do so, they would exceed all your expectations.

September 1st.

LETTER XI.

IN order to prove the propriety, of commencing, from the Delaware, a grand canal between the eastern and western waters, I noticed in my last letter, the rise progress, and present condition of the works between the Susquehanna and Delaware. I have shewn that about 500,000 dollars were expended upon those works, and that the failure, to complete them, was no less unfortunate for the public than for those who had invested their property in them.

It is absolutely useless, at this time, to pry into all the original causes of the stoppage of those works, since the scrutiny cannot re-produce the time and funds expended; since the losses have chiefly fallen upon those, who now ask legislative protection; and, since the errors were either the effect of ignorance of canal navigation, and therefore pardonable, or of design on the part of individuals, most of whom have ceased to exist. Upon a future occasion these and other causes may be particularly pointed out.

It is enough for intelligent men to understand, 1st. That a most important public work was begun; 2d. That, from unforeseen causes, it remains unfinished; 3d. That those who honestly and by legislative sanction engaged in the undertaking are unable to carry it on; and 4th. That its completion is an object, in which every man in the commonwealth is interested.

The intentions of the companies, indeed, have been uniformly avowed and applauded in the acts of incorporation and their sup-

plements; the companies were taken under the protection of the state, and upon the faith of this protection their funds were expended; they have violated no law or engagement, and are entitled to countenance as long as they preserve this character.

The question, therefore, which next presents itself for consideration is simply this—in what manner can the legislature fulfil its duty at once to the public and to the companies? and this question makes it useful to state more particularly, than I did in my last letter, the circumstances, in which the affairs of the companies were involved, after the suspension of the works, as well as their present situation.

1st. Owing to the original mismanagement, the perversion of the funds by persons not now belonging to the companies, and the failure of other subscribers to pay their instalments, the stocks of the companies fell into utter disrepute in the market. 2d. Many, who held shares to a small amount, gave up all hope of ever receiving either interest or principal. 3d. Others, who also held shares to a small amount, determined to speculate upon the misfortunes of the companies; they bought up at greatly depreciated rates, debts and prizes due by the companies, brought actions against the companies for the full nominal amount, and in some instances actually recovered. 4. A few other subscribers, who held shares to a large amount, and who were therefore deeply interested in the ultimate completion of the works, perceived that all the real estate, &c., of the companies would be lost, in consequence of the recoveries just mentioned, unless they risked more of their property, and took the chance of losing or saving the whole. 5th. Those persons, in consequence, satisfied many of the claims brought for prizes, &c., redeemed the credit of the companies, and thus became still more anxious for the success of the canals. 6th. Still, as the shares were so much scattered, that none of the holders could sacrifice their time and attention in the prosecution of the affairs of the companies, some further measures were necessary. 7th. These measures were fortunately adopted to the satisfaction of the parties; those, who held shares and could or would not act, voluntarily and by common consent transferred them to such as would act, leaving it to the option of those, to whom they were

transferred, either to return them in 1820, or to keep them upon paying the whole amount of the original subscription.

It, therefore, appears, that the affairs of the companies have been voluntarily placed, by the stock-holders, in the hands of men of capital and enterprize, originally and now in particular deeply interested in the success of the works, and that, at all events, the original subscribers are saved harmless.—It is to the proposals of these managers, that the legislature is to listen; these are the men with whom the legislature should concert measures for accomplishing what I may truly term a national undertaking.

There is no doubt, but that, if those, who now hold stock in the Susquehanna and Schuylkill, and Delaware and Schuylkill canal companies, could have foreseen its present depreciated state, they never would have subscribed; and it is quite as certain that they would now rejoice to receive for the stock two-thirds, perhaps less, of the sums originally paid by them:—but they have no alternative, but the loss of their whole expenditure or a successful prosecution of the canals, and the latter they cannot accomplish without legislative aid. If, then, there were no other inducement than to prevent the distress, that those individuals must experience, if they fail, I should suppose it to be sufficient to call forth legislative aid; but when I consider, that the support asked for is not merely for individual relief but for public good, and that the honor and interests of the commonwealth loudly call for the prosecution of those canals, I can conceive no appeals more deserving of attention. In such circumstances, indeed, as those in which the companies are placed, they are at the mercy of the legislature, and therefore it will have either the merit of performing an all-important duty to the present generation and posterity, or the odium of having shamefully neglected it.

The opportunity that is now presented to the legislature, is fortunate in many respects; the superintendence of individuals, deeply interested in having the work done speedily, well, and economically, is secured, and no one, who is at all acquainted with public works, can be ignorant of the value of this superintendence. In a republic especially, we all know that public servants do not perform their duties as faithfully as they should do;

we know, in what a scandalous manner the public money has been squandered in the hands of petty contractors, surveyors, and commissioners in the interior counties; and the members of the legislature know this as well as any other description of citizens whatever. It is a fortunate circumstance, therefore, that there is a certainty of strictness on the part of those managers of the two canals, who are so deeply concerned.

There, is, besides, another fortunate circumstance for those who have such prejudices as I mentioned, in my last letter; the companies are so much concerned, that they will not refuse any mode of co-operation, which the legislature may insist upon. And here it is proper to resume the consideration of the subject—how can the legislature best aid those works?

I have heretofore shewn, that the state has ordinary and extraordinary resources adequate to any internal improvements; of course, it might purchase up the whole canal stock, estates, &c. and go on with the works; or it might lend the companies adequate funds for their completion. Yet, although either of those proceedings would be doing no more than duty, and for the public benefit, there is no doubt but that opposition would be shewn. I confess I should not advocate the first mode, because I have no confidence in public overseers or managers; but the latter mode is unexceptionable.

I am confident, however, that it would not be adopted, unless the sentiments of your representatives should be greatly changed; and, therefore, I rejoice that there is another mode which, if well understood by the next legislature, I cannot but believe will be approved of, although it was last winter rejected in the lower house. This mode I will now mention.

I have heretofore shewn, that the legislature in 1795, granted the companies the privilege of raising 400,000 dollars by lottery, to go on with the canals; that two classes were drawn, and but about 50,000 dollars raised. Of course the companies have still the authority to raise by lottery the remaining 350,000 dollars. They have not, however, been able to avail themselves of this privilege, because the legislature has granted so many other lotteries.

In 1807, the legislature appropriated 300,000 dollars realized from auction duties, to be paid to the canal companies for stock to that amount, as soon as the canals should be completed.

It is, therefore, evident, that both those legislative aids, as they were indubitably meant to be, are, under present circumstances, perfectly useless.

The companies want funds at once; they can get none from lotteries, whilst they can be out-bidden by so many other schemes; and the 300,000 dollars can answer no present purpose.

In these circumstances, the companies made a proposition to the legislature at its last session, which was not accepted, I hope because it was not sufficiently understood. It was to this purpose:

“You, legislators, are the guardians of the people’s interests; the people’s interests will be greatly promoted by the completion of the canals between the Susquehanna and the Delaware; we are unable to complete them, and find that the lottery privilege of 1795, and the appropriation of 1807, are at this time useless.

“We know that you are not now disposed to encourage lotteries, but your present opinions cannot affect our lottery privilege of 1795; we therefore propose to relinquish all claim to the 300,000 dollars appropriated in 1807, if you will enable us to realize the effects contemplated by the lottery law of 1795; that is, you now refuse to grant new lotteries; carry this wish into the form of a law; say, that for five, ten, or more years or until the sum allowed to be raised by the law of 1795, but not yet raised, shall have been realized, there shall be no new lottery granted, upon the condition of our giving up all claim to the 300,000 dollars appropriated in 1807. By this means you will not grant a new lottery, but merely enable us to fulfil the intentions of the law of 1795; you will enable us to go on with the canals; and you will stop the petty gambling in lotteries of other states.”

So simple, so moderate, a proposition as this, coming from respectable citizens anxious to complete a work of immense public utility, and made to a legislature having millions of dollars at its control, ought to have met with a favorable reception; and yet, if the proposal had asked the legislature to indemnify the companies for their losses at once out of the treasury, it could not have had a more undeserved fate. In the senate the proposal was received with illiberality, and even when passed

there, was negatived in the lower house. But I must mention particulars.

As soon as this proposition was made to the senate, they passed the bill altered in such a way as to express these sentiments:—

“We are convinced that the completion of the canals would be of immense utility—we are obliged to you for giving us back the 300,000 dollars, but we won’t allow you to carry the law of 1795 into effect, unless you agree that the state (and not you, as that law intended) shall have as canal stock the 350,000, raised by lottery, which was originally intended as a sinking fund to reduce capital expended, and of course the tolls. If you will agree to return us the 300,000 and to give the 350,000 in stock also, when you get that sum, we will let you get the latter by lottery, if you can, and we will give you the use of it.”

No one can mistake the state of this business; the senate knew very well that the companies were at the mercy of the legislature, and, instead of patriotically assisting them as they should have done, took advantage of their situation, not only to exact a return of the sum granted in 1807, but the sum granted in 1795.

If you did not know that the companies really were at the mercy of the legislature, you might well suppose that they rejected such illiberal terms, but they could not do otherwise than accept them, harsh as they were and totally unworthy of an enlightened body.

Yet, after all this, after the senate had gained all that avarice itself could have desired, and after the companies had given up from despair, the house of representatives rejected the bill altogether—not after a discussion of its merits, not because it was an act unworthy of the state, but because one or two country members got up and positively asserted that it was impossible to make such canals!* that the whole was speculation! that the

* It was, among other curious arguments, asserted by Mr. Peter Frailey, member from Berks (which county would be immensely and indeed more than any other benefitted by the canals) that, as the country to be passed through by the canals was a limestone country, it would be utterly impossible to make them—upon this, I need only say that every farmer and miller, residing in a limestone country,

bill was a mammoth one! that the printing of it cost a great deal! that the legislature was pestured every year about those canals! &c. &c.

Such were the weighty arguments of your representatives against the passage of a law, altogether advantageous to the state.

Are you not, my fellow citizens ashamed, of such representatives? Is this the way you ought to be represented in a republic? Is this the way republican government ought to be administered? Is this the way your estates are to rise in value? Your woods, ores, and general productions to find a ready market?—For my own part, I can conceive nothing so disreputable as such conduct, nothing so likely to bring republican governments into contempt—Such proceedings do not pass unnoticed, they make serious impressions, they confirm the prejudices of the enemies of free government, without in the least strengthening the affection of its friends.

But, to return to the special subject. This proposal having been rejected by the last legislature, no change is to be expected but from a change in the representation, and therefore on you it depends, whether those works, which if finished, would add so much to the wealth and reputation of our state, are to be abandoned or carried on; whether the scites of those canals are to remain, as they now are, monuments of a niggardly or imbecile policy, or shall exhibit the evidences of intelligence and true patriotism, a flourishing internal trade.

It is very evident that there are various other modes, by which the legislature may co-operate with the companies; no difficulty will be opposed by the latter; and, therefore, we shall see whether the next legislature shall be more entitled than the last to the applause and respect of the commonwealth.

Nothing less than a thorough change in our state policy, and abandonment of township legislation for an intelligent system of measures becoming a large and respectable commonwealth, can preserve to Pennsylvania any reputation as a state, or to the citizens the advantages they have hitherto enjoyed. Our neighbors

knows very well how easy it is to stop any hole by puddling;—which, if once well done, will last forever.

on the north and on the south, so long behind us, are now greatly in advance of us in works of an universally useful description: the authority of General Washington, of Mr. Jefferson and of the ablest engineers, are every day urged in favor of a communication between the Atlantic and lakes by the Potomac; and immense sums are every year expended upon that route: and on the north the influence of Mr. Gallatin and Mr. P. B. Porter are successfully employed to open a route by the Hudson, Mohawk, and lake Ontario.—But, for Pennsylvania, there is no influence making, no efforts are employed, and even her own citizens seem to be careless or unconscious of her decline.

This is the more astonishing, indeed, as the interest of every man, farmer, manufacturer or merchant, must suffer by this apathy. We have ten millions of uncultivated acres, but who will purchase or settle them, that is aware of the prevailing opposition to internal improvements? we have ores, coals, ochres, shut up in the bowels of the earth, such as are every day coming into demand, but who will stay and work them? every body knows that other states are wisely improving their rivers, &c. and population will certainly settle where there is such public spirit; our lands will be less valuable than those of other states; the produce of our farms cannot be carried to market as cheaply as the produce of our neighbors, and therefore we shall be undersold, and gain perhaps no more profit than will pay ordinary expenses.

All these evils may be prevented by a liberal policy, but this liberal policy never will prevail as long as a majority of your representatives erroneously think that bank dividends are of greater importance than equally great profits from canals and the consequent improvement of the country. Nothing can be more true than that every dollar of indirect taxation at last returns to the pockets of those who paid the tax; and it is equally certain that every dollar expended upon internal improvements raises the value of every man's estate; money so appropriated is not lost, as many of your representatives think, it is placed out at the very best interest.

September 5th.

LETTER XII.

I HAVE shewn that the most important internal improvement would be, a water communication between the eastern and western rivers; that on this object the legislature ought to bestow immediate attention; and that it is not necessary for the state to expend a cent of public money upon that part of the route between the Delaware and the Susquehanna, which is more than one-fourth of the whole distance, and the most difficult to open; I say the most difficult to open, because it is now ascertained that a canal must be opened the whole way, and that even that part of the Schuylkill between Norristown and Reading, which, it was at first supposed, might be used, will not answer.

As, therefore, no money is necessary for the eastern part, there ought to be the less difficulty in going on with the remainder, that is the improvement of the west branch of the Susquehanna. But before any thing of this kind can be attempted, accurate surveys, estimates, &c. will be necessary, and these should be obtained from able engineers, aided by water-men of experience, and from no other persons.

The next object, most worthy of legislative attention, and which can be effected without any impediment to the other, is the substantial improvement of the Susquehanna from Middletown to the north line of the state. This work should also be superintended by an engineer, that the navigation may be really improved and not made more difficult, as has hitherto been often the case in other instances. In order that this improvement, which is of great importance, may be so considered by every reader, I will offer my remarks under these distinct heads: 1. The present state of the river: 2. The improvement wanted and the expense of making it: 3. The effects of improvement from the north-east branch: 4. Those from the north-west branch.

1. The Susquehanna has at all seasons a sufficient quantity of water for any sort of river navigation, if it were confined within one channel, or rather if its breadth were not so great; but, the bed of the river being very wide, owing to the force and volume of the spring floods, it frequently happens in summer that large

boats cannot obtain an ascending navigation. As it is here proposed merely to improve the river from Middletown to the state line, there is no necessity for saying any thing of that part of it below Middletown; from that town to Wilkesbarre, about 125 miles, the river is in several places impeded by rocks and ripples, which might be easily removed, under the direction of an engineer, so as to diminish the width of the main channel, and afford a complete ascending as well as descending navigation, at all times. From Wilkesbarre to the state line, 103 miles, there are no falls, and but two or three rocks injurious to navigation; the obstructions, to be removed, are what are termed tumbling stones or pieces of rocks detached from a fixed foundation, and ripples which may be termed rapids in contradistinction from the pools, or deep gently flowing water above and below them. As it is to the ripples that most attention is due, there being above 20 in the distance of 95 miles, it is necessary to mention their nature more particularly:—they appear like so many bars running across the river; they are principally formed of clay and gravel; and, as the volume of water is always very great, in passing these bars it flows with a rapidity in proportion to the obstruction. So easily may these ripples be removed, that it has not been uncommon for boatmen to dig a channel through them in order that they might ascend. Perhaps the best way to remedy these defects would be to raise wing-walls wherever there is a ripple, that is, to diminish the width, and of course increase the depth of the channel; if this were done the navigation would be so complete that boats of 10 or 12 tons might ascend the river in its lowest state in summer.

2. Should the legislature think proper to improve this river, the improvement should be made from the state line, with the stream; because by the lower improvement the general navigation would not be so soon brought into action, as by the upper; because the great utility of the work will be to draw into our state the produce of the south-west part of New-York; and, because the work itself can in this manner be best accomplished.

I have now before me a statement of the nature and extent of the obstructions to be removed, in the first 100 miles, as well as an estimate of the expense of removal: these data are founded upon the authority of Judge Mathias Hollenbach, who is well

known to possess great personal knowledge of the Susquehanna, and upon that of Messrs. Alpheus Dodge, John P. Arndt and David Rosecrantz, for many years and at this time boatmen upon this river, upon whose knowledge and veracity strict reliance may be placed. According to this statement, the extent of all the obstructions for 103 miles, is but eight miles; these obstructions I have before described; the average distance between the obstructions is about two and an half miles; the expense of removing the whole is stated to be 3205 dollars, but as we know that all estimates of clearing rivers and opening roads have hitherto been exceeded by the actual expenditure, I add to this sum 50 per cent which makes the total cost 4807 dollars and 50 cents.

The nature of the obstructions from Wilkesbarre to Middletown I am not so well acquainted with; it is certain, however, that their removal will require greater labor and expense than those above Wilkesbarre, say twice as much, or 10,000 dollars; and that the whole cost of clearing 230 miles of one of the most important rivers in the union, will amount to 15,000 dollars; this surely is so insignificant a sum compared with the object, that there should be no hesitation in appropriating it. But, as I have before said, much will depend upon the superintendence; the money ought not to be appropriated, if ignorant or interested men are to expend it; but, if put at the disposal of an honest and capable engineer, aided by intelligent watermen, will certainly answer all expectations.

3. To be able to appreciate justly and fully the importance of the Susquehanna, and the immense advantages which Pennsylvania would derive from opening the navigation effectually from the north line of the state, little more is necessary than to examine a good map and to trace the sources of this great river.

The north-east branch of it rises in the lakes Otsego and Canederago; it is navigable for small boats from its source, and might be easily made so for boats of any description: its source, therefore is nearly in the geographical centre of the state of New-York; it is within ten miles of the Mohawk river and of the canals making by New-York along the bank of that river as a water communication to the lake Ontario. After passing lake Otsego, this branch flows nearly in a southern direction for 70

miles, through some of the most productive lands and flourishing settlements in the state of New-York; in its course, it is joined by the Unadilla river, and having reached our line passes it, forms what is called the Great Bend, and then re-enters New-York: it then proceeds along the southern line of New-York for about 60 miles, receives the river Chenango, again enters Pennsylvania and is joined by the north-west or Tioga branch from the westward.

This north-eastern branch is so intimately connected, by its own and its tributary waters, with the productive counties of Otsego and Chenango in particular, and affords advantages so superior to those of the Mohawk, at least in its present state, that it cannot but become the medium of an intercourse highly beneficial to Pennsylvania, if our legislature will faithfully do their duty. For, however desirous New-York may be to serve its own capital, as Pennsylvania ought to be to serve Philadelphia, it will not be so unjust and impolitic as to tax its remote citizens to do so, but will aid in improving its southern districts and waters, although serviceable to Pennsylvania, as we now improve ours although obviously and chiefly to the benefit of Baltimore. We may, therefore, reasonably calculate upon the improvement of those rivers, within New-York, which water some millions of her best lands, although, as those rivers flow into Pennsylvania, the produce of the lands may be conveyed into this state and not be transported to New-York. At all events, it is our duty to do our part in this great work; the people of New-York who reside upon the waters flowing into Pennsylvania, call for improvements, and if we were to derive no other advantages than the north-east branch offers to us, they would be sufficient to justify the expense of thoroughly improving the Susquehanna within our own lines. Important as this branch is, however, it is much less so in every point of view than the north-west branch, of which I am now to treat.

4. The north-western branch, as every reader may see upon the map of the United States, opens a trade with from six to eight millions of acres of as fine land as any in the world; that is, by good management on the part of Pennsylvania, the whole import and export trade into and from the middle and western districts of New-York, from lake Oneida to lake Erie, and com-

prehending the flourishing Genessee country, may be secured or made to pass through Pennsylvania. That this may be clearly understood I will mention the particular points, by which this connection may be opened.

The north-western branch of the Susquehanna is formed by rivers and creeks, some of which have the same source as the Genessee and Allegheny rivers, whilst others are connected with or rise with the numerous small lakes, which flow into the Ontario. The *southern or Tioga source*, is within about 12 miles of the head and navigable waters of the Allegheny; a fact, which shews, that if there were no route entirely through our own state connecting the eastern and western waters, a good one might thus be opened. By this source a direct and easy communication is opened to the head waters of the Genessee river, and down that river there is a direct communication with lake Ontario. The *middle source* is the river Canistro, which is navigable to the town of Arkport, situated at the head of the Canistro, about 75 miles by water from the Pennsylvania line: from Arkport to the Genessee river the distance is but twelve miles; to lake Canadarque ten miles; to Angelica twenty-two miles; and to the Allegheny at Oleanne, Major Hoop's settlement, forty-five miles. At the latter place the Allegheny is sixteen rods wide, and the navigation excellent all the way to Pittsburgh. The *northern source* is the river Conhocton, upon which is situated the town of Bath, from whence it is but about ten miles to Crooked lake, which opens a water communication to lake Ontario.

These three sources unite a little to the west of the town called Painted Post, and form the north-west branch of the Susquehanna, which flows for almost 80 miles nearly in a south-eastern direction until it enters Pennsylvania and joins the north-eastern branch at Tioga Point.

Upon this north-western branch, and at a distance of 18 miles north-west of Tioga Point, is situated a handsome and flourishing village, called Newtown, from whence it is but 21 miles to Seneca lake, and from the head of Seneca lake, the distance by water to lake Ontario is under 100 miles.

Of all the points that I have mentioned, this is, in my opinion, the most important; 1. Because I have the best information,

that can perhaps be furnished, from persons well acquainted with the country, for saying that a complete water communication, by canals and a few small locks, can be opened from Newtown to the head of Seneca lake, for less than 10,000 dollars: 2. Because I know that Mr. Philip Church, son of Mr. J. B. Church, who owns a large and valuable estate (100,000 acres) upon both banks of the river Genessee, including the town of Angelica, attended during two sessions of our legislature at Lancaster, and pledged himself that a canal or a turnpike road should be made between Newtown and Seneca lake, if Pennsylvania would improve the Susquehanna within her own lines, say for 200 miles, which I have already shewn could be done for 15,000 dollars at the utmost: 3. Because the formation of this canal or road, and this improvement of the Susquehanna, would certainly, as Mr. Church declared, be the means of conveying the produce of six millions of acres into Pennsylvania, but a small portion of which we now receive, owing to the neglect of the legislature to improve the Susquehanna.*

When it is considered, therefore, that nature has formed four important and safe outlets, for the trade of the western part of New-York, all of which unite at our state line; that whatever difficulties exist in New-York, its citizens offer to remove; and that the present state of the Susquehanna alone opposes the entrance into our state of all the produce conveyed by those outlets; it surely is not only surprising but shameful that Pennsylvania should have representatives so ignorant or regardless of her interests, as not to have hearkened to the admonition of Mr. Church, and proceeded at once to improve our own waters.

No doubt, Mr. Church and the other residents in the western part of New-York, would prefer aiding the trade of the city of New-York and not that of Philadelphia, if they could do so as cheaply and conveniently; but, as that gentleman said, "the Susquehanna is the natural course through which we should go, that route is shorter and cheaper than by the turnpike road to Catskill or Newburgh; clear your river, and you will command the whole of our trade."

* See Appendix No. 2.

But Pennsylvania has as yet done nothing, and therefore Mr. Church and others have abandoned the works, which they had begun, for opening a communication between the Susquehanna and the lakes, and are now actively engaged in improving the roads from the western counties to the Hudson. For one road alone Mr. Church subscribed to the amount of 13,750 dollars, a fact, which shows the enterprize and ability of this gentleman, and the supineness of our legislature in not adopting the useful suggestions which he offered to them. In consequence of this narrow policy, the trade of the western counties now passes either to Montreal by the St. Lawrence, or to New-York, by the Bath, Coschection and Newburgh turnpike, and thence down the Hudson. It is not at all surprising, therefore, that the reports of the treasury should exhibit the decline of Philadelphia, and the rise of New-York in very striking colors.—Before the state of New-York began to form roads and canals, Pennsylvania as an importing state, stood in comparison with New-York as 12 to 7; but since New-York began to make roads and canals, since even party rancour has been suppressed for this great object, the scale has turned as much against Pennsylvania and for New-York, as it was before the reverse.

What indeed can be a more convincing proof of the intelligence of the New-York legislature, and the ignorance of our own, than these facts: a canal navigation is now completing along the Mohawk: a turnpike road is now forming from Bath to Angelica: at the last session of the legislature of New-York, Dewitt Clinton, Gouverneur Morris, Stephen Van Ransellaer, P. B. Porter, Simeon Dewitt, Thomas Eddy and William North, all men of talents, of high reputation, and of opposite politics, were appointed a committee to explore the country between the Hudson and lake Erie, and to report to the next legislature such improvements as they might think necessary for the internal prosperity of the state, and for securing to the city of New-York its present high standing; these commissioners left Albany in June last and have just returned after performing their duty. What a contrast does this form to our stagnant condition; not one public road, not one canal forming; not one cent appropriated at the last session for any public improvement whatever; not one commissioner appointed to inquire what

should be done to raise the state to its former splendor, or preserve it upon a level with our sister states—all this economy too, whilst millions are left in the hands of delinquent and able creditors at one or two per cent interest.

— In my next I will continue to point out the importance and necessity of abandoning this negative kind of legislation and government, and to shew how easily we may derive from the south-western part of New-York, ten times as much trade and intercourse as Maryland derives from our own south-western districts. No one can pretend to dispute the superiority of Baltimore as a market, for the counties of Adams, York, Franklin, Cumberland &c. however he may regret the loss of their intercourse with Philadelphia; and it must be equally apparent that Philadelphia offers a superior market to that of New-York for 12 or 14 counties of that state; we have given the people of Adams, &c. turnpike roads and canals to carry their produce to Maryland, and the least we can do is to improve our northern waters, our Susquehanna, if for no other purpose than to supply us with an equal quantity of produce to that which Maryland naturally receives.

September 8th.

LETTER XIII.

IN my last letter, I endeavored to shew the importance of improving the Susquehanna, from its entrance at the north line of our state to Middletown; and, in order to induce you to agree with me in opinion, respecting that object, I traced the sources of the river and the several out-lets, by which we may draw into Pennsylvania, the immense and valuable products of the western parts of New-York.

Although my chief intent is to urge the improvement of the Susquehanna, and although I intended to defer to another number any recommendation for improving the Delaware, I find this place the most fit for speaking of that object, since it is connected with the question of relative distance to New-York or Philadelphia from the lakes, which I intend to discuss in this letter.

The river Delaware is principally formed by two large streams, the Mohock, which rises in the county of Delaware, and the Popacton, which rises within the county of Ulster, both in the state of New-York, and the latter within 15 miles of the Hudson. The navigation of both these streams is adequate to the ascent or descent of vessels of ten tons for above fifty miles, before they unite and form the Delaware. After having joined, the Delaware flows nearly in a south-eastern direction, for about 85 miles, where it turns to the south at the town of Milford, and passes nearly in a south-western direction for about 70 miles to Easton, from Easton to tide water at Trenton 50 miles, nearly a south-eastern direction; from head of tide water to Philadelphia in a south-western direction, 34 miles—total 239.

I am aware that, to render the navigation of this river perfectly safe, a large expenditure would be necessary; but it is not the cost but the advantages that follow the expenditure, which a wise legislature should consider. The society for promoting internal improvements, which existed in 1791-2, estimated the cost of clearing the river at less than 8000 dollars, but if it could be cleared for thrice that sum, the state should rejoice at the appropriation. In its present state, the river is navigable during the spring floods from its source: from Milford heavy articles are transported on rafts to Philadelphia, at a less expense than they could be boated to Philadelphia from Easton; upon a single board or spar raft, from 3 to 400 bushels of grain have often been transported for above 150 miles: the transportation in this way costs 75 per cent less than the carriage from Ulster county to New-York. It is, however, on account of its advantages as a route of communication from the western parts of New-York, that the river deserves attention; and that these advantages, as well as those of the Susquehanna, may be understood and compared with the routes to New-York, I will now enumerate the claims of each:

1. I have heretofore shewn that there is no water communication from lake Otsego to the Hudson: the distance by land from that lake to Albany is 60 miles, from Albany to New-York 165 miles—in all 225. But there is a water communication from lake Otsego down the Susquehanna to Harmony 70 miles, from Harmony to Stockport by land 20 miles turnpike; from Stock-

port to Philadelphia 239—total 329. It is evident therefore, that as the route to New-York has 40 miles land carriage, more than the route to Philadelphia, nothing is wanting to secure even some of the trade of the middle counties of New-York but the improvement of the Delaware and Susquehanna. But if this were problematical on account of the difference in distance, this objection is more and more removed every mile to the south and west of lake Otsego.

2. I will not, however, dwell upon the trade of the middle counties, although I am persuaded that the greater part of it may be acquired by Pennsylvania, either by the Susquehanna or the Delaware, should the legislature improve those rivers. The most important object is a communication with the extensive and important country from Seneca lake to lake Erie; and I do again aver, that the whole import and export trade into and from this country may be acquired by this state, through any or all of five distinct routes. Which of those routes should be first made perfect may be ascertained sufficiently well perhaps by the subjoined statements; my opinion is that the improvement of the Susquehanna from the boundary line would answer all the present purposes.

The turnpike road, which is now making from Catskill on the Hudson to a point on lake Erie 20 miles north of Presqu' Isle, passes nearly in a direct line from east to west, and is 296 miles in length. This road passes at the head of Seneca lake, which head is almost exactly half way between the extreme ends of the road at the Hudson and lake Erie. I shall therefore calculate the distances by the several routes to Philadelphia and New-York, from Seneca lake.

FIRST ROUTE—TO NEW-YORK.

From Seneca lake to Catskill by turnpike,	156
From Catskill to New-York by water,	125
	<hr/>
	281

Although the total distance by this route is not great, the extent of turnpike is an insurmountable disadvantage, greater than any of the routes to Philadelphia is affected by.

SECOND ROUTE—TO NEW-YORK.

From Geneva, at the outlet of Seneca lake to Oneida lake,	-	-	90
Oneida lake to Mohawk falls,	-	-	109
Mohawk falls to Schenectady,	-	-	56
Schenectady to Albany,	-	-	15
Albany to New-York,	-	-	165
			<hr/> 435

Of these 17 miles by land: it is to be remarked besides, that although New-York has done much to improve the water route for the first 250 miles, the navigation is still more difficult in many places than any part whatever of the Susquehanna from Middletown to our north line.

FIRST ROUTE—TO PHILADELPHIA.

From Seneca lake to Newtown, by land,	-	21
Newtown to Harmony, by water,	-	78
Harmony to Stockport, by turnpike,	-	20
Stockport to Philadelphia, by Delaware,	-	240
		<hr/>
		359

SECOND ROUTE—TO PHILADELPHIA.

From Seneca lake to Newtown by land,	-	21
Newtown to Tioga Point, by water,	-	18
Tioga Point to Wilkesbarre, on Susquehanna,		95
Wilkesbarre to Easton, by land,	-	60
Easton to Philadelphia,	-	84
		<hr/> 278

I consider this as the best route, under present circumstances, or at least until the canal navigation should be opened from the Delaware to the Susquehanna. Should the legislature expend 5000 dollars upon that part of the route from our state line to Wilkesbarre, there can be no doubt but that the preceding 33 miles would be rendered capable of an easy transportation, by the legislature or citizens of New-York. Of that part of the

route from Wilkesbarre to Easton 32 miles were turnpike in 1807, the remaining 28 miles were then an excellent road, and no doubt will also be made turnpike, under the law in force for that purpose. An appropriation for the Delaware part of this route is an object of great consequence.

This route, it is to be observed, is shorter than either of the New-York routes; but there are other circumstances which call upon the legislature to improve the north-western part of it, from the state line to Wilkesbarre. This town is well situated for becoming a depot for the general produce brought down the Susquehanna; and the Philadelphia bank is about to open a branch there, which will greatly contribute to this object. Should the Susquehanna be improved, therefore, a market is here opened, to which the produce of the western counties of New-York may be brought the whole way by water, and from whence by water and by an average land carriage of but 15 miles, return cargoes may be taken either to lake Ontario, to the town of Arkport, to Genessee or within 12 miles of the Allegheny. No route that New-York can establish can prevent this result if the legislature of Pennsylvania will do their duty.

THIRD ROUTE—TO PHILADELPHIA.

From Seneca lake to Tioga Point,	-	-	39
Tioga Point to Nescopeck, on Susquehanna,			121
Nescopeck to Lausanne, by turnpike,	-	-	28
Lausanne to Easton, by the Lehigh,	-	-	45
Easton to Philadelphia,	-	-	87

310

Of this route but 49 miles by land. Nescopeck is also favorable for a depot, and the communication with Easton a matter of much consequence. For many articles, particularly grain, Easton is as good a market as Philadelphia: having an excellent stream of water and good mills, the millers of Easton give as good a price for wheat as can be got any where in the neighborhood of Philadelphia; their flour they send to Philadelphia at 25 cents per barrel.

FOURTH ROUTE—TO PHILADELPHIA.

From Seneca lake to Nescopeck,	-	-	160
Nescopeck to Sunbury,	-	-	38
Sunbury to Philadelphia,	-	-	120
			<hr/>
			318

Of this route 141 by land. Much of the road from Philadelphia to Sunbury is turnpike, and laws exist authorising the construction of the remainder in the same manner.

FIFTH ROUTE—TO PHILADELPHIA.

From Seneca lake to Tioga Point,	-	-	39
Tioga Point to Middletown,	-	-	221
Middletown to Philadelphia,	-	-	84
			<hr/>
			344

Of these 344, 105 by land, of which the last 84 are turnpike. If the canals from the Susquehanna to the Delaware were completed, the whole distance from Seneca lake to Philadelphia would be but 330 miles; the whole of which route may be made by water, if the legislature will adopt a system of policy, worthy of the reputation and ability of Pennsylvania.

3. On a fair comparison between these routes to New-York and Philadelphia, no intelligent man can hesitate in giving the latter a decided preference, as the market with which a trade can best be maintained by the people residing west of Seneca lake.—Two millions two hundred thousand dollars must be expended, even according to Mr. P. B. Porter and Mr. Gallatin, before the circuitous route of 435 miles from lake Ontario by the Mohawk, can be opened for an ascending or safe descending navigation to the Hudson, and if this were done, another perhaps equally large expenditure would be necessary to open the navigation from lake Ontario to lake Erie. On the other hand, the route by the turnpike, from the Hudson to lake Erie, although very direct, is so expensive that, if the Susquehanna were improved, there is no doubt but that ten tons would pass down that stream for every one sent by turnpike to the Hudson.

And, as it is so apparent, that, with due exertion, Pennsylvania can secure the trade of that part of New-York west of Seneca lake, the superiority as an importing and exporting state to the western waters, must be equally so; yet, as I shall shew in a subsequent letter, unless Pennsylvania shall soon exert herself, she will lose not only the trade to the Genessee, &c. but the trade, which she now in a great measure possesses to the western part of Pennsylvania, to Ohio, Kentucky, &c.

All, then, that is wanting, to secure to this state a valuable exchange trade in the products of the respective states, and the profits upon exports, and the goods imported by sea, in return, is, that the legislature should gradually clear the Susquehanna, as I have heretofore pointed out, from its entrance upon our northern boundary line to Wilkesbarre, Nescopeck, Sunbury and Middletown. Nature has done much for us, but we have done, comparatively, nothing for ourselves.

September 11th.

LETTER XIV.

BESIDES the arguments, which I have hitherto urged to prove the importance of clearing the Susquehanna, and enabling the canal companies to complete the navigation from the Susquehanna to the Delaware; there are others which call upon the legislature quite as forcibly, to abandon the impolitic and shameful indifference, which has characterised its proceedings, during the last ten or twelve years in particular. Amongst these arguments are the right and claim which Philadelphia has to equal protection with any other part of the state; the enterprising measures taking by other states to the obvious distress of Philadelphia; the right or claim of the northern part of the state to legislative attention; and the benefits that would follow the direction of attention to those objects.

If the legislature had a covert disposition to reduce Philadelphia, which at one time was in all respects the capital or principal city of North America, to the rank of a borough or village, they certainly could not have conducted themselves more systematically to attain that object than they have done. Ever since the seat of government was removed from this city, your repre-

sentatives seem to have considered themselves released from the duty of protecting it; in taking the oath, to promote the welfare of the commonwealth, they seem to have regarded Philadelphia as not belonging to it, or at least as a mere tributary; and, indeed, they have appeared to be ignorant, that Philadelphia and its liberties contain above one-sixth of the whole population of the state.

I am not so uncharitable as to say, that, there has been any design, to check the prosperity of this city; but I am fully warranted in declaring, that, the legislature has no claim to gratitude from Philadelphia, for her prosperity of late years; indeed, her prosperity is astonishing, when we consider that it is altogether the result of individual enterprize—and yet, considerable as this prosperity is, it is by no means so great as it would have been, had the energies of the state been as faithfully employed for Philadelphia, as the energies of this city have been employed for the state.

But there is a point beyond which individual enterprize cannot extend, and we have nearly reached that point: Philadelphia must rise with the state and by its aid, or it must remain stationary, to say the least, whilst Baltimore and New-York are pressing on to divide, between them, those favors, which the state ought to, and can, secure to its own capital and to its own citizens.

I am not a friend to a pitiful jealousy or envy of sister states, but I think a rivalry, for distinction in arts, manufactures, trade and internal improvement, not only natural but beneficial. I would not obstruct a road or a stream, because it passes into a sister state, but I think it is quite as shameful, not to open roads and rivers, passing into our own state, as to do so. If Pennsylvania could not secure to her own citizens a complete intercourse from east to west, there could be no impropriety in permitting our neighbors, to the north and south, to derive advantages in the west, which nature forbids the east to partake of; but, as nature has placed no such barrier, as Pennsylvania is as capable, as any of the states, of great internal improvement, the legislature is to blame if sister states and cities surpass us in arts, trade, and manufactures.

I admit now, as I have done before, that Baltimore is the natural market for some of our southern counties, but I deny

that it is the natural market for the counties beyond the Allegheny; and yet it is notorious that, every year, the import trade from Baltimore to Pittsburg increases, to the injury of Philadelphia: and, for this simple reason, the state of Maryland has wisely aided every turnpike road leading to the southern line of Pennsylvania; the turnpike is complete from Baltimore to Chambersburg, but Pennsylvania, which began turnpike roads first, has not 100 miles made, on the route from Philadelphia to Pittsburg, and has year after year refused to aid in erecting a bridge across the Susquehanna. It must be evident therefore, that, if this policy, or want of policy, shall be adhered to, the trade from Philadelphia to Pittsburgh must continue to diminish.

Of the north your representatives have been altogether neglectful, as I have heretofore mentioned when alluding to the east and west road; and, in consequence, one-fourth part of the territory of the commonwealth remains almost a wilderness; although it is well known that this northern section contains as good lands and as excellent streams as any other, and although it is equally well known that the emigrants from the New England states would settle upon those lands, instead of going to the westward and of course from good markets, if there were either good navigation or good roads opened, by which they might take their produce to market and return with goods in exchange. New-York, like Maryland, has noticed our inattention, and from the north is about to rival Baltimore, and excel Philadelphia, in supplying even the Pittsburgh market.

The object of New-York, in expending such immense sums, almost without cessation, since 1795, has not been merely to draw to her capital the produce of her own remote districts, but to secure to that capital the import trade, or supply, of the whole western country, from lake Erie to lake Michigan. And I am fully persuaded that this object will be attained, unless Pennsylvania shall at once arouse and exert her energies. The means by which New-York can secure these advantages, I shall now notice.

FIRST ROUTE.

The Hudson river is navigable for ships to the town of Catskill; this tide-water navigation is so excellent, that this part of

the route can scarcely be considered a difficulty, or an impediment. From Catskill to lake Erie a complete turnpike road, 296 miles in length, has been laid out, and actually completed above half the distance, between those points. This route has these advantages, which give it a superiority to the routes through Pennsylvania or Maryland, as a communication with the lakes, and the rivers Ohio, Scioto, Wabash and Miami. 1. From Baltimore or Philadelphia to lake Erie, the distance is nearly 500 miles by present routes, but the distance from New-York to lake Erie, by the new route, is but 421 miles. 2. That part of the New-York route from that city to Catskill, 125 miles, is excellent navigation even for ships; but that part of the Philadelphia route from the Allegheny to Presqu' Isle by French creek, requires great improvement. 3. That part of the New-York route from Catskill to lake Erie, passes over a country much more level than the Philadelphia route, and will henceforth have the great advantage of a turnpike. 4. The seasons in New-York are more fixed than in Pennsylvania, and the snow lies longer on the ground, to the great advantage of travelling. It must be apparent, therefore, that the New-York merchants can send goods to lake Erie, as cheaply as they can be sent to Pittsburgh by the Philadelphia merchant; and that, as the whole ascending navigation, of the Allegheny and French creek, is to be undertaken by the latter, the former will have a preference even in our own north-western districts.

I may go farther, and truly say, that, as the New-York merchant can, under present circumstances, command the trade of lake Erie, and the head waters of the Allegheny, he can enter into a competition with the Philadelphia merchant, even at Pittsburgh, and of course down the Ohio.

SECOND ROUTE.

This New-York route, that I have spoken of, although the principal one, is not the only one; there is another in great forwardness, which will probably become as important as the one I have mentioned. From New-York to Newburgh, on the Hudson, the distance is 66 miles, ship navigation; from Newburgh to the navigable head of the Allegheny, 272 miles. To exhibit the views of New-York on this subject, I copy the following

extract from a report made to the New-York legislature in 1807, and shall state the result.

“ The legislature of this state, in 1805, authorised a turnpike road from Bath, in the county of Steuben, to Angelica, in the county of Allegheny, and from thence by the head of Chetauque lake to lake Erie. The turnpike road wished to be made by the petitioners, from the Great Bend to Bath, would be a link, completing the chain of turnpike communication between the waters of the western lakes and those of the Hudson. The important advantages likely to result both to the commercial and agricultural interests of the state, from this communication, the committee suppose, are too obvious to need particular enumeration; the committee, however, cannot forbear remarking that the communication promises to add a vast increase to the trade of the Hudson with lake Erie, and also to open an intercourse between the Hudson and great south-western waters, and thereby to afford grounds for expecting that it will place the city of New-York, in a situation, by means of the villages on the Hudson, to be a successful competitor with other cities in the union, for supplying Pittsburgh and other places on the Ohio and Mississippi with goods and merchandize. This expectation will appear the more reasonable, when it is considered that, the distance, by the lake Erie turnpike, from Angelica to Oleanne, which is a navigable branch of the Allegheny now, is no more than 24 miles, through a country, which admits of a very good road; that loads of considerable burden may pass from the Oleanne to Pittsburgh and back again, without any interruption either from falls or rapids; that the distance from Newburgh to the mouth of the Oleanne is about 272 miles, whereas the road from Philadelphia to Pittsburgh is 310 miles long, and crosses the main body of the Allegheny mountains; and, that those mountains are entirely avoided by the route from Newburgh to the Oleanne.”

This extract shews, the objects of New-York, and the foundation upon which that state rests its hopes of acquiring almost a monopoly of the western trade; nor can any one pretend, that this prospect will not be realized, if Pennsylvania shall do nothing to preserve to the east and west the benefits of intercourse.

In consequence of the report, which I have just quoted, the legislature of New-York passed a law, in conformity with the

request, for a turnpike road from the Great Bend to Bath: various circumstances, however, interfered to prevent the road from being made, but I am told that preparations are now making to go on with it. The road from Bath to Angelica, 41 miles in extent, is now completing, so that early next summer there will be a complete turnpike road from the Hudson to the Allegheny.

I presume, therefore, that no sensible man can hesitate respecting the duty of Pennsylvania. An enterprising and intelligent gentleman, of New-York, who had taken great pains to induce the legislature of that state, in 1807-8, to proceed extensively in internal improvements, but whose efforts were not then successful, wrote the following remarks in a letter, dated Albany, November 1809.

“Owing to the supineness and illiberality of the legislatures of New-York and Pennsylvania, the cities of New-York and Pennsylvania are in a fair way of losing all the benefits of the trade of one of the finest and richest countries the sun shines upon. The intelligent and leading men, in the Genessee country, are turning their attention to *Montreal* as an outlet by means of lake Ontario and the St. Lawrence; with this view villages are starting up; store-houses are building; grist mills are erecting on different parts of the shores of the lakes and neighborhood; and vessels of approved models for lake navigation have already been built, and others are on the stocks. From all the information I can obtain, it is extremely probable, if not certain, that this intercourse will be beneficial to both countries; from the Genessee country, which possesses a most fertile soil, may be sent in great abundance, flour, beef, pork, hemp, pot-ashes, flax-seed, staves, lumber, and many other articles equally in demand, all of which should pass through our own country, and no doubt would, if our legislators would take the requisite measures.”

Fortunately for New-York, its legislature can no longer be complained of; at the last session such measures were taken, as will, in all probability, totally change the current of trade from the St. Lawrence to the Hudson: all parties, all men, have, in that state, united to sustain its solid interests; but the odium of indolence, illiberality, and indifference, still rests upon Pennsylvania.

From what I have said, in this letter, I think it must be apparent, 1. That Pennsylvania is about to lose all the advantages of an exchange trade between her eastern and western districts, as well as those which a complete communication with the lakes would introduce; 2. That Baltimore and New-York are now partaking of those profits, which this state can and, as a matter of pride and justice ought to, secure to its own capital; and 3. That the policy of New-York in particular is calculated to secure to her citizens the monopoly of the trade of her own state, of the western part of Pennsylvania, and of the states of Ohio, Kentucky &c.

These results are far from being the effect of superiority on the part of our neighbors, as to resources or situation; in both these respects we actually excel them, but we want men of energy and intelligence to take advantage of our circumstances, and wanting these, the benefits which nature has placed at our disposal are of little moment.

September 13th.

LETTER XV.

HAVING, in my last letter, pointed out the measures, which neighboring states are taking, to secure to themselves a monopoly of the western trade, which we, if correct measures shall be taken, may secure to ourselves; and having shewn how shameful it will be, if the state shall not support its capital, at least upon a level with the capitals of other states; it may be useful to state, in the present letter, the general advantages which the people, of the state at large, would derive from opening a water communication with the western lakes and with the lakes Seneca and Ontario in New-York:—these advantages are of two descriptions, internal, and external or those derived from an intercourse with neighboring states.

INTERNAL.

Knowledge. Public and private good are promoted in proportion to the extension of information, and information is best extended by society; it must be admitted, therefore, to be an evil,

when a district of country is in such an unimproved condition, that a man must ride 70 miles to a place of worship, a library, or a post-office; in such circumstances the benefits of society are not felt, and such is the case in some of the northern and north-western parts of Pennsylvania, where men are to be found very little superior to the Indians on our frontiers. A water communication from east to west, and from south-east to north-west, would reduce the distance between residents in the west and north-west parts of the state, so that, even with the present population, the benefits of society would begin to be felt.

Wealth. The wealth of a state consists in population and productive labor; and in the capacity of every citizen to acquire, by an exchange of his surplus products, with sufficiency and facility, all that is necessary to his wants and comforts, and the improvement of his offspring. It must be evident therefore, that internal improvements promote wealth, because without those improvements the intelligent farmer would deem it madness to settle in a country: in unimproved districts none will settle, who regard the morals of their children, because in such there is no stimulus to industry, little more is raised than what is consumed, and much of what is raised is employed, as Mr. Fulton expresses it, to brutalize society.

Manufactures. As the improvement of the state would introduce knowledge, population and labor, so the necessity for manufactures would increase, and this necessity would enable the farmers to set up one or more of their sons in such establishments: this course would, besides, be the more readily pursued in the interior, in consequence of the cheapness of all the necessities of life, and of the abundance of all the raw materials for manufactures, which are every where to be met with, of our own production, or to be had in exchange from other states.

Towns and villages would follow rapidly, the cheap establishment of manufactures, and thus a new interest would be created in our country, upon the firmest basis, to the great happiness of the people, and welfare of their government. The farmer would have a market near his door, for his surplus produce; for his wool, hemp and flax for clothing, and for his grain, for food and malt liquors.

The value of lands, would necessarily rise in proportion to the realization of the effects I have enumerated. If the two routes of water communication that I have mentioned, were open, the value of all the lands or farms for thirty or forty miles on each side of the rivers and canals, would be increased fourfold; this would result from the existence of the advantages which I have enumerated, and from the facility of reaching a market. If those routes were opened, store-houses would be established along them, to which the farmer might convey his produce for sale or for transportation; if, for sale, then he would save the time and expense of going to a distant market; if for transportation, then he might commit the care of his produce to a single person, and instead of consuming his own time and the labor of his cattle in going to a market, might employ them both in preparing a new crop.

The quantity of good lands within our own state, which the different streams of the Susquehanna now water, above Middletown, exceeds eight millions of acres; little or none of this immense property belongs to the state, it is almost exclusively owned by citizens of our state, and is greatly divided and parcelled out. Of these eight millions, seven-eighths are yet in wilderness, and altogether owing to the want of internal improvements. It must be apparent, therefore, that the citizens, of all the middle, north-western and western counties of the state, are deeply interested in the improvement of this immensely valuable country, and that they must derive the principal advantages from improving the Susquehanna and connecting its waters with the Delaware and lake Erie.

The woods. The settlers upon lands in the north-western and western parts of the state are now at a heavy expense in clearing their lands of timber; they are compelled to cut down and burn the valuable oak, chesnut, hickory, pine, locust, &c. because they cannot transport them to a market. If the Susquehanna was improved and the canal opened to Philadelphia, their timber might be sent to this port, either for home use or for exportation, and a price got for it equal to the whole expense of clearing the farm producing it, or perhaps equal to the present price of the farm itself.

Nor would the settler alone be benefitted by this measure; our ship building would be increased perhaps four-fold, by such an abundant supply of all kinds of timber fitted for such uses; our mechanics in wood would also receive abundant supplies, to their own as well as to the public advantage.

Every year the timber brought down the Delaware is becoming dearer, whilst, at Columbia and Middletown on the Susquehanna, timber of every kind sells at about one-half the Philadelphia price: so great is the difference in price, that a French gentleman, residing in Wilmington, Delaware, purchased at Columbia and hauled in waggons from thence to Wilmington, last autumn, above eighty thousand feet of the best boards, to be used in the construction of a manufactory at the latter place: and there can be no doubt, but that, in eight or ten years, lumber will be brought by waggons to this city, owing to the high price of Delaware lumber, unless a water communication shall be opened with the Susquehanna. The owners of lands and woods, as well as those who purchase woods, are therefore materially interested in internal improvements.

The mines and quarries in our interior are opened only in such places as afford the facilities of transportation, and as these are very few, we have not by any means reached that improvement in these respects, which the public interest requires. The higher the price of any article, the less it is used, and of course if we open the routes I have recommended, the carriage of our ores, marble, &c. will be so low as to increase the demand for them and enable us to supply them to the whole union.

In fact very little has been done to unfold the mineral and fossil productions of Pennsylvania, and perhaps this is owing more to the want of internal improvements than any thing else. We have iron, copper, tin, lead, bismuth, sulphur, a great variety of ochres, clays, flints, &c. all important to ourselves, and many of which might be exported to advantage, if the legislature would enable the state to make use of those gifts of nature. In England many discoveries in the mineral world have been made in the course of opening canals, and there can be no doubt, but similar results would be experienced in this country, which is yet comparatively in a state of nature.

Coal, one of the most precious of all minerals, is found in great abundance upon the Allegheny, both branches of the Susquehanna, and upon the Delaware, yet it is imported into the port of Philadelphia from Virginia and even from Europe! What can be a greater proof of legislative incapacity or indifference than this? in the interior, where wood is plenty, it is not surprising that coals are not used, even when as convenient, but there is every inducement for the owners of coal-beds to transport this necessary article to those parts of the state, where the population is numerous, wood scarce, and manufactures flourishing; the farmers, however, cannot, under present circumstances transport the coal, because the high price of carriage would not permit them to sell it at the price of the Virginia exporter. If the Susquehanna and Delaware were improved, and the communication opened with the western waters, instead of importing, we might export coals; and the price and the qualities of those coals would enable us to rival, perhaps excel Virginia; we have coals of three descriptions, one particularly adapted to family use, another more fit for manufactories, and a third possessing the qualities of the Kilkenny coal; of this last description four bushels, with two bushels of common charcoal, will make and keep up for as long a time as good a fire as twelve bushels of the Virginia coal.

Mill-seats, breweries, distilleries, glass-houses, furnaces, and foundaries, would, in particular, be aided by the two improvements which I have recommended; and on the whole, I think, it must be admitted, that those improvements would have a general and not a partial effect, and that the mass of our population would be increased, and made much more wise, comfortable and happy, by their completion, than they are at present.

EXTERNAL.

I have heretofore said, that, that state, which shall first open a communication with the lakes, will be likely to retain a trade with the settlements upon them, even if there should be another and shorter route opened through another state. As Pennsylvania, therefore, can open the shortest route to the lakes, she should also strive to be the first to open one, and thus doubly secure an important intercourse.

I have not a doubt, but that, Pennsylvania will become a flourishing manufacturing state, if the legislature will do its duty; whether the European war shall continue or cease, our exports cannot for many years equal their amount hitherto, and of course internal industry must take the place of external trade: if such is the natural course of things to be looked for, if it is wise to foster internal industry, it is also wise to open a vent for our productions, and this vent may be gained to the westward, by trade with sister states and with the Indians.

No doubt other states will manufacture also, but each state has peculiar advantages for particular branches of manufacture, and hence will arise an exchange trade: for instance, New-York has little or no iron but what we furnish, and therefore we may secure a trade in iron and steel, hollow-ware, cutlery, &c. to the state of New-York and very probably to all the western states. Such articles as we cannot raise or manufacture as cheaply as other states, we should not attempt to obtain in any other way than in exchange for our own staple articles.

Salt, for instance, is an absolute necessary; much is now imported into Philadelphia from Europe, and sells here at an average price of one dollar and a quarter per bushel; yet we might obtain any quantity of this important article from New-York, at 50 cents per bushel, if the water communication, that I have recommended, was opened to Seneca lake. There were made at Onondago, which is connected with the Seneca lake, in 1802, 96,000 bushels of salt; in 1803, 91,000 bushels; and in 1804, 133,884 bushels; the average price at the works 27 cents per bushel: the whole distance from the works to Philadelphia by water, would be 433 miles, and the transportation of a bushel of salt by this route would cost but from 12 to 14 cents; a bushel of salt, therefore, instead of costing us at present one dollar and a quarter, might be had by the route I have recommended, at 50 cents.

Besides, therefore, obtaining this necessary article for our own population at 75 cents per bushel less than it now costs, we might be enabled to export it to the northern and southern states, in exchange or at a considerable profit for cash. The annual saving upon our own consumption would be so great, that we should now

make considerable sacrifices in order to secure such important advantages hereafter.

The fur trade is also deserving of our attention, in considering the advantages to be derived from a cheap, safe, and expeditious route to the lakes, whether we consider it as connected with our internal manufactures or our trade to China.

The superiority which the Montreal companies have maintained over the citizens of the United States in prosecuting this trade, is really astonishing; notwithstanding all the good effects of prior intercourse and extent of capital which the Canadians possess, one might suppose that our enterprising people would have engaged in a successful competition, yet it is singularly true that this trade, far from diminishing so much as was anticipated, continues to be very prosperous in the hands of the Canadians.

I am aware that government obtains considerable quantities of furs from the posts of Chicago, &c. which, to accommodate the owners of property at Washington city, are conveyed to that place and sold much lower than if they were sold in this city; but, instead of being an obstacle to private enterprise, this would promote it. The best way perhaps, would be to form companies and caravans, for this undertaking, as experience has shewn that the British traders will, if they can, cut off individuals engaging in this trade.

The goods, which the Canadians import from England to exchange for furs, are chiefly blankets, coarse woollen cloths, printed cottons, linens, cutlery, arms and ammunition, tobacco, hats, shoes and stockings, thread and twine: many of those articles we could furnish better and cheaper, than they could be imported, and there are none which we could not sell as cheaply as the Canadians.

The mode of transacting this exchange is very disadvantageous, compared with a trade, which we might open: forty-two months elapse from the shipment of the goods from England to the receipt of furs in exchange, so that the merchant, allowing that he has twelve months credit, does not receive a return to pay for those goods and the necessary expenses attending them, which are about equal to the value of the goods themselves, un-

til two years after they are considered as cash, which makes this a very heavy business.

In 1802, the produce of the fur trade was 184,300 skins of various kinds; of which the following passed through the United States to the China market; 13,364 prime beaver, weighing 19,283 pounds, 1250 fine otters, and 1724 kitt skins. This, however, was not an American but a British speculation, which was unsuccessful, as the furs were sent through the London market to China and not direct from the United States. The advantages which we possess over the British in this trade; are thus confessed by Sir Alexander M'Kenzie. "From America there are no impediments to the trade to China; they get immediately to market, and the produce of them is brought back, and perhaps sold in the course of twelve months. From such advantages, the furs of Canada will no doubt find their way to China by America."

Independent of these advantages, which we may so easily improve, we possess Detroit, Michilimackinack, and nearly all the other points of intercourse with the Indians, which the French established when masters of Canada; we have a frontier upon the whole extent of the country whence the Canadians draw much of their furs, nay the country which furnishes the greatest quantity of furs is within our own lines; and we can collect and bring them to our sea ports at much less expense and risque than the Canadians can carry them to Montreal. The principal route, which the Canadians take, is from Montreal by the Ottawa river to French river 420 miles, up French river to lake Huron 100 miles, across lake Huron to St. Mary's falls 110 miles, from those falls to the Grand Portage, which is their depot or principal establishment on the south-western bank of lake Superior 300 miles, to the lake of the woods 170—in all 1100 miles.

One-fourth at least of this route is portage, or *decharge*, that is the furs or goods exchanged, and also the canoes are to be carried by the rowers, around rapids; falls, &c. principally on the Ottawa river—or in shallow water the goods are carried, and the canoes towed.

Taking Michilimackinack as the centre of the Indian trade, a complete water communication may be opened from Philadel-

phia to that port, of 946 miles, whereas the route by Montreal to the Atlantic exceeds 1100 miles, and much of this over bad roads.

When these disadvantages of the Canada route, the length and severity of the winter, and its effects upon the trade of the St. Lawrence, are considered on one side; and when we reflect upon the unfavorableness of the warm climate of New-Orleans on the other; it must be admitted that the best route for an export of furs is through one of the middle states; and as Pennsylvania in particular may command the navigation of lake Erie, or rather the most cheap and expeditious connection between it and the Atlantic, I am of opinion that the advantages of the fur trade may be calculated upon as an argument in favor of the improvement of our rivers. If we shall not exert ourselves to obtain this valuable branch of trade, it will probably pass into the hands of the people of New-York, who certainly have at this time, owing to their enterprize, greater facilities of communication with lake Erie.

The benefits, which would be felt by the introduction into our state, of the surplus *grain, wool, hemp*, and other staple productions of the western states, are so obvious, that there is scarcely any necessity for mentioning them; if intended for exportation, or for domestic consumption and manufactures, these productions are equally valuable; by their introduction into Pennsylvania, we should be able to command a certain sale for our own surplus productions or manufactures; we should be able to maintain a profitable export trade to foreign countries, or an exchange trade with our sister states to the north or south; we should realize all the profits of transit, from the goods or the persons conveying them; we should be able to keep the necessities of life, and the raw materials for woollen and linen cloths, at as low a rate at the least as they could be had any where on the Atlantic coast; and we should be able to raise such profits upon the canals from tolls, as would not only keep them in repair and give the *maximum* interest to the stockholders, but at last enable the state to open the canals and dispense with tolls altogether.

In the state of Ohio, from whence by lake Erie, as I have heretofore shewn, a water communication may be opened to Phi-

Philadelphia, *wheat* generally sells at 33 cents per bushel, in this city it now sells at two dollars per bushel: in Ohio *Indian corn* sells at from 12 to 15 cents per bushel, in Philadelphia it now sells at 93 cents per bushel; in Ohio *pork* sells at two dollars per hundred, at Philadelphia, at seven to eight dollars per hundred; in Ohio, *black cattle*, bullocks, sell at three to four dollars per hundred, in Philadelphia, at seven to eight dollars. Those articles may be had in some parts of our own state, at the same rates. Every man, therefore, is able to appreciate the benefits which the opening a cheap communication to such a country, would introduce. In many parts of Ohio salt is made in abundance, to such an extent indeed that hopes are entertained there of under-selling the New-York manufacturers, on the Ohio and Mississippi: for grain and salt provisions, therefore, this state can have no superior. The tedious and dangerous route to New-Orleans, and the great uncertainty of that market, raise the price of produce, there, nearly to the same rate as at the Atlantic ports; but if a water communication from the Delaware to lake Erie were opened, all the principal necessities of life might be sold in our market for home use or for exportation, one-third at least less than they now cost.

Whether all these advantages shall be realized or not, will depend upon yourselves or your representatives; it is impossible for you or for them to feel indifferent, if you seriously consider the subject, for I think I have sufficiently shewn that the whole state, and not merely Philadelphia, will be greatly benefitted by the opening the canals and rivers, between the Delaware and the Allegheny.

September 17th.

LETTER XVI.

IN writing these letters, I have hitherto taken care to recommend those improvements only, which, if completed, would diffuse the greatest portion of advantage amongst the greatest number of our citizens; 1. A water communication, by means of the west branch of the Susquehanna, from the Delaware to lake Erie; 2. The clearing the north branch of the Susquehanna, so as to open a communication to Seneca lake, and to the coun-

try west of it. This course seemed the best for me to pursue, since, in calling your attention to matters of such moment, the objects should be few and prominent; and since, if those two improvements were carried on under governmental protection, those of a lateral description would naturally arise and accompany them.

To induce you to use your influence in favor of those important objects, I have shewn—1. The fiscal ability of the state to complete those works: 2. That companies already incorporated require no pecuniary aid from the state to enable them to open the whole water communication, 133 miles, between the Delaware and the Susquehanna; 3. That, by the west branch of the Susquehanna a water communication may be opened from the Delaware to lake Erie, by three or four routes, at a total average extent of 491 miles; 4. That, by the north branch of the Susquehanna, a trade may be opened with the western part of New-York, eight millions of acres of “as fine a country as the sun ever shone upon:” 5. That, owing to the negligence of the legislature, Pennsylvania is not only now losing many of the advantages of a trade to the north-west and west, but is in danger of being shut out of all mercantile connection with those important parts of the union; 6. That, by due exertion, Pennsylvania may defy competition in a trade with our own western counties, or with the new and flourishing settlements from lake Ontario to lake Michigan: and 7. That the interests of the capital city of the state and of the state itself, are both deeply at stake, and imperiously calling for legislative intelligence and energy.

In discussing these several topics, I believe, I have fulfilled all that I promised in my first letter; so that, nothing remains but to offer a few remarks upon some particular points.

Should the legislature think proper to undertake one or both of the works, which I have recommended, this need not prevent them from attending to improvements of a secondary description. If the funds of the state will not, in any particular year or years, admit of direct appropriations for many purposes, a wise legislature can be at no loss to enlist private capital in aid of public works. Of this there is perhaps no better evidence, than is furnished by the result of the state's subscription for one-third

of the stock of the Centre turnpike; had not this subscription been made, private confidence, in all probability, would not have been gained; but, having been made, a subscription of 95,000 dollars was speedily obtained from individuals, 40 miles of the road were completed in little more than a year, and the entire undertaking is in a fair way of being finished, to the great benefit of the public and interest of the stockholders.

What particular improvements should claim this sort of legislative attention, will, of course, depend upon the propositions to be made for them by individuals. There are improvements, however, which require another description of aid, the east and west road for instance; to aid this work, the state should at once grant from the treasury a sum adequate to its completion.

Of all the minor works, this, I think, is most deserving of attention, and therefore I shall dwell upon it in this place. As the state now owns little or no lands in Pennsylvania, and as they are parcelled out amongst our citizens at large, there can be no just excuse for neglecting any particular part of the state; yet it is notorious that the southern part of Pennsylvania has monopolized nearly all the regard of the legislature for many years, although the state has been as faithfully and liberally paid for the northern as for the southern lands. Of late, some attention has also been bestowed upon the central part of the commonwealth, but so little has been bestowed upon the northern counties, that the whole extent of country, from the east to the west lines of the state, and for about forty miles south of the line separating this state from New-York, is comparatively a desert. As a matter of justice, therefore, the owners of this fourth part of the lands of Pennsylvania, are entitled to legislative aid.

In the next place, the importance of a route from east to west through the northern counties, is such as should induce the state to open it in the most perfect manner: this seems to have been the opinion of the legislature, at one of its sessions, for it had this road surveyed and marked out at an expense of 2000 dollars, but at succeeding sessions this spirit was not followed up, and now, after all the exertions of the owners of the lands in that quarter, there remain above 50 miles to be opened.

Those who have read my remarks upon the importance of a trade with the western part of New-York, must, I think, be pre-

pared to admit the importance of the east and west road; for, by this route, a communication may be opened to that country, totally independent of any aid to be derived from the state or citizens of New-York. Much time, besides, must elapse, before a water communication, such as I have recommended, can be completed, so that in the mean time, we should embrace every other mode of speedily arriving at so interesting an object. The merchants of New-York, I have heretofore shewn, can command the trade even of the north-western part of our own state, because our main road by the southern route leads to Pittsburgh, and gives no facility of communication with the head waters of the Allegheny, whereas the New-York roads lead directly to the north-west corner of our state and of course to the Allegheny: our east and west road, therefore, would cut off this intercourse now so much desired by New-York, and would enable the Philadelphia merchant to maintain a trade to the counties of Warren, Mercer, &c. without going first to Pittsburgh, and then ascending the Allegheny, 80 or 100 miles, to a market. At present the difference in the price of transportation is certainly in favor of New-York, which would not be the case, if the east and west road was opened: so that the question is not now, as formerly, will not the opening this road injure the southern road and counties? but it is, will not New-York secure the whole of the trade of the north-western counties, if the illiberal jealousies of the south shall continue to prevent the opening a northern route? policy, therefore, as well as justice, demands legislative interference in favor of this road.

The *southern road* to Pittsburgh will always be an important one, and it therefore is the duty of the legislature to hold out encouragement to such companies as may propose to turnpike that part of it from the Susquehanna westward.

The *central road* would be entitled to legislative protection, if no other advantages were to result from it than the improvement of the middle counties; but, as an excellent route of communication to the western part of the state, it has a double claim to attention.

A turnpike road, from the Great Bend, to intersect the Easton and Wilkesbarre turnpike, would be an object deserving legislative attention; by this route a communication would be opened

through the whole extent of our northern territory to the New York turnpike roads leading to the Genessee; and it is probable, from the utility of such a road, that the whole of it might be completed by private subscription.

Bridges over the principal streams are objects so essentially necessary, that there would seem to be no occasion to recommend them; yet, so little has been done in this respect, that, if I were to say nothing on the subject, my silence might perhaps be considered as a tacit approval of such shameful indifference. When a law is passed, incorporating a company for any special improvement, many of your representatives imagine they have done wonders? yet it often happens that such laws answer no other purpose than to fill up our statute book. Such is the fact, with regard to the law passed for incorporating a company to erect a bridge across the Susquehanna at Columbia; and such in all probability will be the case, at least for several years, with respect to the laws passed at the last session for constructing bridges across the Monongahela and Allegheny at Pittsburgh. Strangers or citizens of other states, if they merely read the titles of the laws, that are annually passed, may readily conclude, that the state is liberal and our improvements astonishing; but, in reality, Pennsylvania has no claim to such distinction; a great number of laws are passed with a previous knowledge that they never will be carried into operation, and there are many passed, which as soon as passed are violated with impunity. No doubt, as many turnpike and bridge companies are incorporated by this state as by her neighbors; but, there is this material distinction; when your representatives pass an incorporating law, their cares cease, if the companies go on with the work, it is very well, if they cannot go on from a want of means, your legislators shrug themselves and say, "we have done all we could," which is as untrue as this course is unwise; other states, on the contrary, assist such companies as cannot proceed upon their own capital, wisely concluding that the public funds cannot be better employed than in bringing a market for every man's produce, as it were, to his own door.

No doubt there are many streams over which bridges ought to be thrown, and for which objects the public funds ought to be employed; there is one point, however, upon which immedi-

ate attention ought to be bestowed. The seat of government is to be removed in 1811, to Harrisburgh; state pride, therefore, as well as a regard for the public interest, should induce your representatives to attend to this important object speedily and diligently.

What other states are doing, I have already in a great measure explained, in order to excite your feelings as Pennsylvanians, and to induce you to reflect seriously upon your internal concerns. When turnpike roads were first commenced in England, a military force was employed to protect those working upon them, so strong were prejudices at that time and place against those improvements; but experience has there converted this opposition into active support and patronage: such in a great degree were the prejudices in our country, and they have vanished in the same way. According to Dr. Priestley, this reluctance to embrace novelties is wisely intended by providence, for if it did not exist, indecision and change would be the popular characteristics; but, says that writer, when experience has shewn the utility of any project, the people ought and will aid it to the utmost of their power. It is not a little singular, then, to find in Pennsylvania, some of those prejudices which she was the first to explode, and which no other state regards.

South Carolina is actively engaged in improving her rivers and extending her canals.

North Carolina is equally attentive to the Catawba and other waters.

Virginia is rivalling New-York, in improvements of canals, locks, &c. in the neighborhood of her capital and collieries, and I am told that rail-roads will also be very soon introduced there.

Maryland has already appropriated by acts of incorporation and lotteries, above a million of dollars to secure the trade of the Susquehanna and the southern part of Pennsylvania.

Kentucky has appropriated 500,000 dollars for a single object, the clearing the Ohio, at the falls at Louisville.

New-York annually expends about 300,000 dollars upon internal improvements and other useful public objects, and raises this revenue by the indirect taxation of lotteries.

Why, then, is it, that Pennsylvania alone is regardless of her vital interest? I put this question home to every one of you. Is it not because you are careless about the qualifications of your representatives? you select men so incompetent, that they make distinctions between your money in the treasury and your wealth in cultivated fields, abundant produce and ability to dispose of it; they are so ignorant as to deny, that the best way to support the expenses of government would be to enable every citizen in the commonwealth to contribute with ease to the necessary funds; they pretend to have your interests at heart, and to prevent taxation, and yet they refuse to aid the capital of the state, upon the prosperity of which it will principally depend whether you are to be taxed or not. In voting for such men, you do not merely waste the money paid them as wages, but you perpetuate the evils of ignorance, sloth and intemperance amongst the people; for, remember, that, a people may be rendered virtuous or vicious at the will of the government.

There is one more argument in favor of internal improvements, which I have not yet dwelt upon, and it is the last that I shall urge. You all profess to value dearly the present system of government, and the enjoyment of civil and religious liberty, and truly so you ought to value them; but mere profession is nothing, works alone give substantial proof of sincerity. If you do not exert yourselves in favor of all undertakings calculated to promote virtue, comfort, and personal independence amongst the people, who will regard your resolutions, professions or anniversary boasts? There is no wise man, who would not prefer a sterile soil and intelligent rulers, to the most fruitful region governed by men incapable of appreciating or developing its blessings.

Recollect, then, that our system of government is in its infancy and upon its trial; indifference hereafter may be excused, but it would now be criminal, because it is now that the enemies of our institutions would wish to bring them into dispute. What a mortifying reflection it would be, if the opinion of a single citizen should be changed, if a single man could be brought to doubt, respecting the excellence of our institutions, because you select men incapable of producing, in this country, so prosperous in climate, soil, and productions, even the conve-

niences to be found under despotisms. You all know, that in Europe, every description of government, despotic, monarchical, and aristocratic, encourages science, arts, manufactures, canals and other useful works; you cannot deny, much as you may dislike those forms of government, but that, in thus acting, those governments evince a real regard for the best interests of the community. Surely, then, in our country, where the government is the work of the people, and constantly guided by them, there should not be the slightest symptom of indifference about objects of such magnitude.

Our system, like every other human production, will be tested by experience, by its effects and not by your professions: and it, therefore, becomes all our citizens to sustain the character of our republic, such as it was designed and ought to be—we must all, in fact, promote the substantial welfare of the people, we must endeavor to make them intelligent, industrious and faithful to their country, and how can all this be well accomplished unless by the agency of men, who are themselves really intelligent, industrious and faithful.

But, if you send representatives to your legislature, who have no other claims to your suffrages than those, which arise from party distinctions; if you disregard the fitness of the men for the station; it will be impossible to sustain the reputation of the republic; some will attribute your faults or those of your representatives to the system itself, and our institutions will thus fall into disrepute.

Every consideration, therefore, for the present or future, public or private happiness of the people of this state, should induce you to select none but capable men for your representatives. To me it will be a great consolation and pleasure, if I shall have been in the slightest degree instrumental in producing effects so essential to the comfort and reputation of a free people.

September 19th.

APPENDIX.

The following documents are published, 1. In order to shew the beneficial effects, which have resulted from the encouragement given, by the state of New-York, to companies associated for public purposes; 2. To explain the system; upon which those corporate companies can best answer the objects of their appointment; and 3. To exhibit the enterprize and intelligence of the legislature of New-York; in undertaking the important works mentioned in the 14th letter.

NUMBER I.

Copies of two letters, from Thomas Eddy Esq. of New-York, to Charles G. Paleske Esq. of Philadelphia.

New-York, 6th Month, 29th 1810.

Respected Friend,

Our legislature did not comply with our application; they appointed seven commissioners to explore the country from Hudson river to lake Erie, in order to report how far the route is capable of being improved: I am one, and the others are Dewitt Clinton, Governor Morris, Stephen Van Ranselaer, P. B. Porter, Simeon Dewitt, and William North. We leave here this day, and I have no doubt the result will be very favorable to our canal company, as it is likely the State or United States will purchase all our stock.

I am very respectfully,

thy assured friend,

THOMAS EDDY.

Amount of tolls 1808, at Little Falls,	-	\$ 4,700 08
ditto Rome,	-	3,002 03
1809, Little Falls,	-	4,723 41
ditto Rome,	-	3,065 93

The balance of the last year was about 3000 dollars and no dividend made. The embargo turned all our trade to Canada, and our people have now got so much in the way of going there, that I am afraid the tolls this year, and indeed hereafter, will be very low.

NUMBER II.

Philadelphia, 9th Month, 30th 1810.

Respected Friend,

The legislature of the state of New-York, at their last session, appointed seven commissioners to explore the whole route from the tide-water of the Hudson river to lake Erie; in order to ascertain the practicability of connecting those waters by canals and locks.

The commissioners left New-York 30th June, and returned about three weeks since; and during their tour, examined the present state of our inland navigation and the intermediate country as far as lake Erie, and are satisfied, that a canal communication may be completed without meeting with any material difficulties.

Engineers are now employed in taking levels from Erie to Genessee river, who are to make returns to the commissioners at New-York 28th November;—who report to the legislature in January. A copy of this report shall be sent thee as soon as it is published. The commissioners undoubtedly will unite in recommending a complete canal navigation, and intirely to abandon rivers and lakes.

The people of our state, duly appreciate the incalculable advantage of improving our internal navigation, on a scale commensurate to so important an object; and are extremely urgent for the legislature to undertake it.—I annex a list of some levels made about two years ago, by an engineer now employed by the commissioners.

I am very respectfully,

thy assured friend,

THOMAS EDDY.

Levels taken by I. Geddes, surveyor of Onandago county, New-York.

From Oneida lake to Three River Point, is 18 miles, 12 1-2 feet fall.

Three River Point to Oswego, at lake

Ontario 24 miles, 124 feet fall.

42 miles.

— Oneida lake above the level of Ontario

136 1-2 feet.

Levels above the tide at Troy, on the Hudson river, viz.

Lake Erie,	-	-	-	541. feet.
Tanawanta Swamp,	-	-	-	551.
Genessee river above the falls,	-	-	-	460.
Boyle Summit, in the township Northfield,				434.
Cayuga Marsh or Lake,	-	-	-	340.
Three River Point,	-	-	-	318.
Oneida lake,	-	-	-	330.
Rome, on the Mohawk,	-	-	-	390.
Lake Ontario,	-	-	-	206.
Owasco and Skineatitas lakes are nearly on a level with Rome.				
Seneca lake, 50 feet above Cayuga, level with Rome.				
From Lake Erie to Fort Schlosser,	-			15. feet fall.
to Lewistown, opposite Queenstown,				332.
to Niagara Fort, at Lake Ontario,				334.

NUMBER III.

Letter from Charles G. Paleske Esq. to Thomas Eddy Esq.

Philadelphia, September 1810.

Dear Sir,

Agreeably to your request, I now state in writing those ideas that I communicated to you this morning, on the subject of opening a water communication from lake Erie to Hudson tide-water. In my printed circular of the 28th July 1808, and my observations printed in December 1808, I delivered to you many remarks to shew the insufficiency of the charter, which are equally applicable to your, as well as our companies; and that experience has shewn, that such a great undertaking cannot be carried through by a number of managers who are changeable annually; and who, receiving no compensation, neglect or mismanage; or who may be induced to make a job of it, or act from local motives or interest.

In draughting the law, (which you had better have prepared on delivery of the intended report,) the following outlines seem to me to be indispensably necessary.

1. To extend the powers of the present Western Lock Navigation Company to the intended object.

2. The stockholders to elect five managers, to form a board; one to act as president, one as vice president, one as treasurer. The President, whilst acting as such, to be engaged in no kind of manufacturing, mercantile, or speculative concern; but to employ all his time and attention thereto; and to receive a salary not exceeding thousand dollars annually. The vice president to act as president in the absence

of the latter; and to receive a salary not exceeding thousand dollars per annum. The treasurer to receive a salary not exceeding thousand dollars per annum; and to give security to the amount of thirty thousand dollars. The other two managers to receive for each weekly or special meeting, if present; at the rate of dollars each. If either of the managers should be found guilty of fraud or embezzlement, or a party in any contract; he shall be immediately removed, pay a fine at the discretion of the Jury, and be condemned to hard labor at the discretion of the court. In case of death, resignation, or otherwise, of any of the managers, another to be immediately appointed by the board until the next annual meeting of the stockholders; who will either confirm the appointment or elect another in their place.

3. All the salaries shall be payable quarterly.

4. All monies to be placed in bank, in the name of the corporation; and to be drawn for by checks signed by the president and treasurer, and countersigned by the secretary, and entered on the minutes.

5. Weekly stated meetings to be held at nine o'clock in the morning; three managers to make a quorum; but if the president should be absent, it shall require the remaining four to make a quorum.

6. The five managers to be authorised,

A. To fix the route; or if recommended by the chief engineer, to alter it. To borrow from time to time, on the credit of the company, and the tolls and profits thereof; such sum or sums of money from individuals, states, or body politic; on such terms and considerations as they may find adviseable. To issue certificates bearing interest at per cent half annually; and to redeem the same at pleasure; or to issue certificates bearing three per cent interest annually, and be entitled to the future dividends with the original stockholders as soon as the first dividend is paid: when the interest of three per cent should cease.

B. To buy or condemn from time to time, so much land as they may think necessary for the use of the canal, towing paths, locks, warehouses, quays, aqueducts, and other necessary buildings.

C. To receive a rent for storage, quays &c.

D. To make collateral cut or cuts to communicate with the grand canal, whenever they may think proper.

E. To make a turnpike road of sixty-six feet wide, whenever they may think it advantageous; and to receive a toll equal to that fixed by water.

F. To make aqueducts, and to enlarge them for carriages to pass; and to receive the usual tolls therefore.

G. To make wing walls and dams, wherever they may find it necessary.

H. The company to be obliged to make a substantial bridge over the canal, wherever a public road is laid out before the canal is digging; but if dug, the county to make all bridges over the same. For all private roads the company to make a ford across the canal.

7. The writs of *ad quod damnum*, should be to the sheriff of the adjoining counties; that improper verdicts may be avoided. In condemnations, the jury ought to be enjoined by law, to take into consideration the benefit resulting to the owner of the lands from the canal passing through the same.

8. The stock of the company to consist of the present shares of the western lock navigation; calculating the original sum paid; adding the interest of seven per cent on the installments until the 1st July next; and to make a round sum of say dollars 200; to call a further payment on that day on each share, and grant new certificates of stock for each share; which now consists of

2280	at 83 1-2	\$ 190,000.
350	120	42,000.
		<hr/>
Dollars		232,000
		<hr/>

9. The stock might be increased to three thousand shares; to be divided among the present stockholders; or at their option until the 1st July next; after that day to be open to the first subscribers.

10. The state to be at liberty to subscribe an equal number of shares as the individual stockholders; not transferable; payable in state certificates of one thousand dollars each; bearing interest of six per cent, payable half yearly; and by installments of fifty thousand and at any time when requested by the managers three months previous thereto. This would amount to six hundred thousand dollars. And to appoint an agent, who shall have access, and may whenever he thinks proper, examine all the books and vouchers of the company; and the cash; and be present at any or all meetings of the managers.

11. The United States to make a free gift to the company, of two millions of acres of land in the western territory, bordering on lake Erie.

12. The United States to be permitted to subscribe ten thousand shares at two hundred dollars each; amounting to \$ 2,000,000 payable in certificates of one thousand dollars each; bearing interest at six per cent, payable half yearly and by installments of one hundred thousand dollars at any time when requested three months previously by the managers; and to become stockholders for the amount paid, and no more. The president of the United States to appoint an agent, with the same privileges as the state agent.

13. The managers to cause in December of every year, a state of their affairs to be published in the newspapers; and forwarded to the

president and governor; and to be laid before the company at their annual meeting.

14. The managers to pay to the stockholders, money-lenders, the United States, and the state for their subscriptions; at the rate of three per cent yearly; payable half yearly; on the first day of January and first of July of each year.

15. To enable the managers to pay three per cent interest to the stockholders, money-lenders, the United States, and to the state for their subscriptions; the managers ought to be authorised to raise by way of lottery, fifty thousand dollars annually, for twenty years; when it may be calculated, that the work done, will produce sufficient tolls and profits to pay that rate, and probably more.

Permit me to add a few general remarks. In this mode only, or on some such plan, the public interest must be joined to individual interest and exertions. It is more than probable, that the stockholders will elect a president and managers that are considerable stockholders; as well, as men of talents, leisure and character: who being sufficiently compensated for their attention; will do their duty to increase their capital, by the dividends to be expected from this then valuable stock. And their transactions, being as it were public and correct; confidence in them would be implicit; and any sum of money could be obtained on a loan, perhaps of four per cent for ever, after the first communication from the Salt-works to Rome on the Mohawk was completed: which being a distance of about fifty miles, might be accomplished in seven years; and which being the most productive, ought to be first executed. The next to be done, would be the communication from the Mohawk to Hudson tide-water. But before any thing farther is attempted; a full and complete survey and estimate of the whole route, and in different directions, should be made by two experienced british engineers of known experience, joined with surveyors of the country, of talents and local knowledge; and the necessary workmen, and best instruments; if even two years or more were lost, and one hundred thousand dollars expended.—As soon as the tract of the whole route is fully ascertained; the lands required, should at once be purchased or condemned, by one and the same jury if possible; and the money therefor paid, or at the option of the land holder, converted into a loan, as stock like the money-lenders. Whenever the canal cuts a piece of land, it would be best to purchase the same, and re-sell it on ground rent when completed; perhaps for twenty times the price. Each lock ought not to have less ground than two acres; to make use of surplus water for mill seats. The mode adopted in Pennsylvania by William Weston Esq. for the size of the locks and canals, is, in my opinion best calculated for this climate; and preferable to small canals and boats, and inclined plains, recommended by Robert Fulton Esq. which are dis-

continued even in England; and would not suit our cold climate; nor would a large canal for arks and sloops be adviseable; since water on some summit levels, could not be obtained in sufficient quantity at all seasons; and it would increase the expense of locks to an enormous amount; nay, be totally impracticable in some places. Hence a turnpike road along the canal, would be highly necessary in New-York; and add but little to the cost; and the toll would pay it soon, though very moderate. The managers must use their discretion to fix the tolls from time to time; but the maximum dividend of tolls and profits should not exceed twenty-five per cent on the capital expended.—The shares subscribed by the state, and the additional shares of individuals, would more than finish the canal, from the salt works to Hudson tide-water; when the tolls and profits would probably pay an interest of six per cent on the capital expended; and allow the managers to pay an interest of six per cent, with the assistance of the sinking fund raised by lottery, on another million on loan: and thus progress until the whole be completed.

As soon as the law is passed; the stockholders should appoint the managers, and enact permanent rules and regulations, for the government of the board; and authorise them to purchase a convenient and large dwelling: the lower apartments thereof to be used for fire proof offices, and meetings of the board; and the upper apartments for the accommodation of the president and family; that in case of indisposition, he may still be able to attend to the duties; for upon the president and the chief engineer, the prosperity of this great national undertaking must ultimately depend.

Sundry of the above remarks are from late private communications of William Weston Esq. and from an act of parliament made in 1801, forwarded by him to me. Wishing to promote internal navigation throughout the United States, I shall with pleasure give you any further information in my power.

I am very respectfully,

Dear Sir,

Your very humble servant,

CHARLES G. PALESKE.

THOMAS EDDY Esq.

One of the commissioners of the state of New-York.

P. S. September 30th 1810.

I have omitted to observe; that it was a great mistake, and caused confusion, disappointment, and serious losses, that the managers of our canals undertook to act as managers of the lotteries: some were

active, and accounted fairly and promptly; some were negligent, and procrastinated the settlement of their accounts; and some acted for purposes of speculation; and some of their accounts have not yet been settled; a considerable balance being claimed by the companies: each manager acting independant of the other, there was no control; no check; no responsibility; no reward for services rendered; no punishment for neglect or defalcation. Though the managers of lotteries should be appointed, and under the superintendence of the board of the canal; they ought to be unconnected with the same: besides, it requires different talents, abilities and exertions to be a manager of lotteries, than those which are requisite for a president or manager of an undertaking of vast importance, such as a canal; to execute which faithfully, must engage all their attention and time. Though this has hitherto not been the case in the state of New-York; I thought it proper to hint this mistake, to guard against the same in future.

Soon after the publication of the preceding letters, when it was ascertained that they were to appear in the form of a pamphlet, pains were taken to acquire more precise information, upon some particular points, than the writer had before been able to obtain. He has now the pleasure to insert the following extracts, from letters received from a gentleman of the first respectability, talents and enterprize, in the state of New-York, which will be found to contain information, deeply interesting to every one, that regards the reputation and welfare of Pennsylvania, and the prosperity of its capital, as objects of pride and solicitude.

It is not believed that the writer of the following letters would be scrupulous about the affixion of his name, yet, as he had not been apprized of such a freedom, it is not taken; and the more especially as the facts and observations themselves are sufficient to secure a deliberate perusal: it is enough to say, that their writer is an inhabitant of one of the interior counties of New-York, personally conversant with all questions connected with internal improvements in that state, and, as his observations prove, as fully acquainted with the errors, advantages, and duties, of Pennsylvania.

With the subjoined letters was sent a manuscript map, the only one extant, of all the country north of the Pennsylvania line and lying between Tioga and Seneca counties, lakes Ontario and Erie; which, it is to be regretted cannot be engraved and furnished with the letters. It is, therefore, that it is particularly recommended to every reader to place a good map before him, as he reads the letters, and to examine it accurately—Adlum and Willis's map should be preferred.

NUMBER I.

November 5th, 1810.

“I HAVE not, until a few days since, been able to procure such precise and accurate information, as would authorize me to make any communications to you, respecting the practicability of connecting, by a canal, the head of Seneca lake with the Tioga branch of the Susquehanna:—and I have thought it better not to write to you, on the other subjects of your letter, until it was ascertained whether there was a probability that the canal in question could be made; because had the making of it been deemed impracticable, it might in some respects have altered the steps, which your legislature will (perhaps I should rather say, ought to) take, to connect Philadelphia with the western part of this state.

“Between the Seneca lake and the Susquehanna there is a large and very wet swamp, from this issues *Seneca inlet*, which after running thirteen miles in a northerly direction, falls into Seneca lake: no part of this stream is navigable excepting the last three miles adjoining the lake; this part will admit boats of considerable burden; the stream is a perennial one, rather swift, but its course is not obstructed by rapids or falls:—*Newtown creek* rises in the same swamp, and, after running in a southerly direction nine miles, falls into the Tioga branch of the Susquehanna, near the village of Newtown: no part of this stream is navigable, it is not so swift a stream as the Seneca inlet, and is equally free from falls or rapids. I have no doubt but that the waters of these creeks, together with what could be obtained from the swamp, out of which they flow, would be more than sufficient to feed a canal.

“This information will convince you that no obstacle exists to prevent the opening the proposed canal; indeed nature has permitted it to be more easily accomplished than the most sanguine person could have expected. What the cost of making it would be, a personal survey by a scientific person can alone determine; it may, however, be safely asserted, that the expense, when compared with the magnitude of the object, will not only be moderate but trifling.

“If the members of your legislature intend to benefit Pennsylvania, by obtaining, to any considerable extent, the trade of the Genesee country, or by retaining the small portion of it which you now possess, I should suppose, that the undertaking, which would first naturally present itself, would be the complete improvement of the navigation of the Susquehanna, from that part of it, which can be most advantageously connected, by roads or canals, with the Delaware and its waters, as far up the river as the point where the Tioga branch crosses your state line. This, although of primary importance, is not the only necessary undertaking: it is essential, for reasons which

will be hereafter mentioned, that a good turnpike road should be made from the western bank of the Susquehanna (opposite to the place, which may be deemed most eligible to connect with the Delaware) to that part of the Pennsylvania line, from which the road could be most easily continued to the village of Newtown. Should such exertions be made on your part, to procure our trade, they will be met by reciprocal efforts on ours. Your turnpike road and improvement of the Susquehanna, would doubtless be immediately extended from your line to the village of Newtown—operations, which, from the shortness of the distance, might, to be sure, be easily effected, but which are so entirely dependent upon yours that they never will be even commenced until yours shall be in great forwardness.

“Previous to the consideration of the advantages, that the proposed improvements would produce, both for your state and for the western part of New-York, it will not, perhaps, be useless to take a general view of the most usual mode pursued by the storekeepers in this country, in making their remittances to the merchants from whom they purchase goods.

“By much the greater part, indeed I believe all the goods, that are sold in this country, are brought either from Philadelphia or from New-York. The produce of this country, *if wheat*, is sent in arks (which cannot return against the stream) to Baltimore or Philadelphia, or which is the same thing to some intermediate place; *if live stock*, it is driven to Philadelphia or New-York. The advantage of sending wheat to Baltimore is, that, the conveyance of it being solely by water, the expense and waste of storage, loading and unloading &c. are prevented. This saving is, nevertheless, more than counterbalanced, by the dangerous navigation of the lower part of the Susquehanna; by the additional distance, which the hands, who navigate the arks, have to return home by land; by the loss of time and expense which the storekeeper experiences in going to Philadelphia or New-York, to purchase goods; and by, what is of more consequence to him than all the rest, the unwillingness of merchants to credit country storekeepers, who, instead of making a direct remittance of their produce in payment for the goods purchased, turns that produce into cash in a distant city, by which the certainty of making the regular remittance is lessened in proportion to the accidents and temptations, to which the storekeeper will be liable, by either losing, squandering, or defrauding the merchant of so transferable a property as money. You will readily perceive that the storekeeper, who takes his produce to Philadelphia and purchases his goods in New-York, is almost equally subjected to the last mentioned disadvantage: then, why, you ask, does he not purchase his goods in Pennsylvania?—because the navigation of the Susquehanna is so uncertain that he cannot tell when to calcu-

late upon receiving them; and because, even if he could wait, without inconvenience, for five or six months, for heavy articles, there is no road to enable him to carry home goods bearing land carriage, and without which he could not carry on his business.

“It is true, that, notwithstanding these disadvantages, some few storekeepers take their produce to, and buy their goods in, Philadelphia; but it is mostly those who make their remittances in live stock; and even many of these, within a few years, have preferred driving their cattle to the North river:—this they have done with reluctance, because vegetation lasts a month longer in Pennsylvania than in this country, the effect of which is that the cattle may be kept in this country until the very moment that the grass fails, and yet could get good pasture on their way to the southward, and of course would arrive in so much better order, that the grazier in the neighbourhood of Philadelphia, being able to keep them on pasture some time after their arrival, could afford to give more for them than the grazier on the north river. Great as these advantages of your southern situation are, they are still insufficient to compensate for the state of your roads, which are so very bad, that the cattle cannot be prevented from leaving them and running into the woods, where they feed upon the laurel and of course many of them are thereby killed. This last circumstance entirely prevents the sending sheep into Pennsylvania.

“By next post I will answer your other inquiries.”

NUMBER II.

November 25th, 1810.

“MY last letter finished with taking a general view of the trade between this country and the cities of Baltimore, Philadelphia and New-York. I shall now proceed to consider what portion of the trade of the western part of this state, Pennsylvania would immediately enjoy from the making the proposed turnpike road, and from the contemplated improvements in the navigation of the Susquehanna; and also, how far those benefits might be extended, and the ultimate benefits your state would derive from the extension.

“The turnpike road being finished, the country through which it passed, would soon be settled; the laurel and other noxious plants would be destroyed, and the pasture would be in much greater quantity, better and cheaper, than on the present roads:—this would not only enable us to send sheep into Pennsylvania and increase the number of cattle driven to that state, but would also bring back to their former market those storekeepers, who have, within these three years past, resorted to the North river. Many farmers, who have not sufficient employment for their horses during the winter, would take their

produce to the establishments, which would naturally be made on the Susquehanna, sell it, and bring back, at a moderate price, either goods for the storekeepers or necessities for their own families. In the event of an extraordinary failure of the waters of the Susquehanna, the storekeeper could bring up into the country the goods of light carriage absolutely necessary to carry on his trade, and wait until the waters should rise to transport his heavy goods. It is, however, to be hoped, that the navigation of the Susquehanna would be so far improved as to render such an alternative unnecessary. Men of business could not only travel speedily from this country to Pennsylvania, say to your capital, but the establishment of a regular and frequent communication by mail would take place, a circumstance of more importance, both in carrying on and promoting trade and intercourse between distant places, than is, perhaps, generally imagined.

“The navigation of the Susquehanna being improved, so as to admit loaded boats to return up to Newtown, those, who at present consider Baltimore as their market, owing to the facility with which they can return with their goods would find it more to their advantage to carry their produce to Philadelphia; and for the same reason, all those who took their produce, whether in wheat or live stock, to Philadelphia, would exchange them for goods in that city, and thereby save the expense and other inconveniencies, which I have before stated they were subjected to, in proceeding to New-York for the purpose of purchasing the articles of their trade.

“The circuit of rich and fertile country, the produce of which Pennsylvania would command, and the inhabitants of which she would supply with foreign and domestic merchandize and manufactures, would be enlarged to an extent far beyond what your merchants, manufacturers or legislators are, I conjecture, aware of. But, let me more particularly consider how far those improvements might be extended.

“The first operation, which presents itself, is the connecting Seneca lake with the Tioga; from the information contained in my last letter, you will be enabled to judge of the practicability of accomplishing this. The next is the improvement of the navigation of the Tioga above Newtown, and of the Conhocton and Canisteo rivers, as far up as Bath on the former, and Arkport on the latter. Whether it is possible to render those streams navigable at all seasons of the year, I cannot positively say, but I conclude that it is from the circumstance of some families, who now reside in this country, having moved up from Fishing creek, near Northumberland, in the months of June of the years 1796-7, in boats carrying ten tons, to within one mile of Hornill's (within a few miles of Arkport) on the Canisteo. After that month, or until the freshets prevail, those streams are so shallow as not to admit of navigation, although they always contain a consider-

able quantity of water. The next improvement is the making a turnpike road from Philadelphia to Amsterdam on lake Erie, making Angelica one of the points of direction. From the Pennsylvania line to Angelica and Amsterdam, the country would admit of a good road, the practicability, expense, &c. of making the road from Philadelphia to the Pennsylvania line, you can best determine. I should suppose, that those improvements would secure to Pennsylvania a trade with nearly all the country between Seneca lake and lake Erie and certainly the trade in live stock of the whole of the Genessee country. How far I may be correct in these opinions, the enclosed map, together with the information I shall give you respecting the trade with Montreal, will in some degree enable you to decide. Had there been a direct road from Philadelphia to Angelica, it would have saved several thousand dollars, in the expense of making a new settlement. By a reference to the map you will find that Angelica is nearer to Philadelphia, in a direct line, than to New-York, or to the North river, by the proposed turnpike in this state, which will be nearly finished next fall. How many gentlemen of your city have been incredulous, when they have been informed that Amsterdam was nearer, in a direct line, to Philadelphia than to New-York, merely because it happens to lie in the same state, of which the latter city is the metropolis.

“ I consider Montreal, and not New-York, as your great rival in the trade of our western country, which has within these two years commenced, and must rapidly continue, to be diverted from the latter to the former city. The merchants of Montreal have, within a few months, established stores at the mouth of the Genessee river, at Sodus bay, and at Otsego, and are giving notice in all our papers that they will not only purchase produce, but advance money on produce deposited with them for transportation to Montreal. They are even extending their views still further, and are making diligent enquiries as to the practicability of rendering the Genessee river navigable, whereby they hope to be enabled to send merchandize up that river, and thence crossing to the Allegheny (a distance of but twenty-five miles) be able to supply the western part of Pennsylvania, the state of Ohio &c. with goods at a cheaper rate than they can be furnished from any of the ports of the United States. From the number of very high and perpendicular falls in the Genessee, many may deem such an undertaking not only as utterly impracticable, but visionary; yet who shall say what it is impossible, for enterprize, aided by capital, and stimulated by a sufficient motive, to effect? who, that is acquainted with the history of the internal improvement of Great Britain, the hills that have been surmounted, the mountains that have been bored through, the rivers over which canals have been thrown, shall assert that Niagara itself will not yield to their exertions? who, that contemplates

the assiduity and perseverance, with which her merchants and manufacturers, aided by government, are turning into canals the ditches of those countries, from which there is the remotest prospect of any quantity of produce being diverted to their island, thus making up for their own want of territory, by engrossing to themselves the interior of other nations—can suppose that they will not strain every nerve to possess themselves of the productions of so rich and extensive a country, rapidly increasing in population and wealth, and with the importance of which its own Atlantic inhabitants are either unacquainted, or else undervalue and disregard.

“Montreal, however, cannot divert from you the produce of this country in live stock, nor can she, as her harbor is frozen for a very great portion of the year, enter into a competition with you to obtain the produce in wheat, to that extent which her local situation and the enterprize of her merchants would otherwise enable her to do. The high price of wheat generally depends upon foreign demand, and in proportion as the demand for so absolutely necessary an article of support is urgent, in that proportion the price is exorbitant; which, together with the bounty, on the importation of that grain, frequently given by the countries in which scarcity exists, produces such an influx of wheat as speedily to supply the exigency, and to render the demand of short duration. The probability, therefore, is, that a foreign market would be glutted from the ports of the United States, before Montreal could supply it with a ship-load of grain, and of course the Montreal merchant could not afford to give so much for wheat as our merchants of the middle states. Indeed it is a fact, that, except during the embargo, wheat never has been so high at Montreal as in the ports of the United States.

“It is evident that the return trade from a sea-port to the interior, which consists of articles of high value in comparison with their bulk and weight, is carried on with cheapness, in some degree proportionate to the quantity of the trade, from the interior to the sea-ports which consists of heavy and bulky produce but of small value. The immense quantity of this rude produce, which, by making the improvements suggested, Pennsylvania would certainly draw into the midst of her population from the Genessee country, &c. would enable her to transmit by return, up the Susquehanna and Canistota, her merchandize, manufactures and surplus articles, at a very cheap rate, by means of the numerous persons and conveyances employed in bringing the rude produce to her markets. Nor is the importance of the measure limited here, Pennsylvanians might transport their goods from the Canistota to the Allegheny (a distance of only 48 miles, 20 of which, from Hornell’s to Angelica, is nearly turnpiked) and thence down that river to the western part of Pennsylvania, to Pittsburgh and the Ohio, and

thus undersell the Montreal merchant, however enterprising and industrious.

"I assure you, that I suggested, several years ago, to many gentlemen of Philadelphia, the practicability of supplying the whole western country with goods at a much cheaper rate, by means of the Susquehanna and Allegheny rivers, than they have been furnished at by the present mode of land carriage to Pittsburg—and, yet, there were very few, who did not regard the project as visionary! this last summer, two storekeepers, one of whom had purchased his goods in Philadelphia, the other in New-York, passed through Angelica, and thence proceeded with their property down the Allegheny—a circumstance, which increases my confidence, that, when the proper improvements shall have been made, the Ohio or western states will all be supplied with goods by this route.

"I shall be happy to communicate such further information as may be calculated to induce your legislature to make those improvements, and to convince them of the absolute necessity of commencing them speedily, if they wish to prevent the trade of this important country from passing entirely to Canada. But let me remark that, besides addressing the legislature, Franklin ought to appeal to the merchants, manufacturers and holders of real estate, in Philadelphia, and urge them to exert themselves to obtain a cheap and expeditious route of communication with the head-waters of the Susquehanna and Allegheny, and of course with the northern and western lakes. I believe that, if they had any just conception of the importance of such a measure that they would make every effort, in conjunction with the legislature to complete the improvements I have mentioned."

NOTES.

The *Genesee country* consists of seven counties; three northern, viz. Ontario, Genesee, and Niagara; four southern, viz. Steuben, Allegheny, Cattaraugus and Chatauge.—Ontario county is, it is believed, the third in the state as to population, although there is still much unsettled land in it.

From Geneva, the principal town of Ontario county, to Albany the distance is 192 miles, in a direct line: from the same town to Philadelphia, about 210.

From Amsterdam, the principal town of Niagara county, to Albany 299 miles—to Philadelphia 305 miles.

From Batavia, the principal town of Genesee county, to Albany 259 miles—to Philadelphia 242.

From Bath, principal town of Steuben county, by the turnpike now completing, to Kingston on the North river, 205 miles—to Philadelphia, by Newtown, Wilkesbarre and Easton, 210.

From Angelica, principal town of Allegheny county, to Kingston 245 miles—to Philadelphia 218.

From Great Valley creek, centre of Cattaraugus county, by way of Angelica, to Kingston 273 miles—to Philadelphia 248.

From Mayville, principal town of Chatauge county, bordering on lake Erie, by way of Angelica, to Kingston 297 miles—to Philadelphia 272.









